S. HRG. 100-52

RADON GAS ISSUES

JOINT HEARING

BEFORE THE

SUBCOMMITTEES ON
ENVIRONMENTAL PROTECTION

AND

SUPERFUND AND ENVIRONMENTAL OVERSIGHT

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDREDTH CONGRESS

FIRST SESSION

ON

S. 743

A BILL TO AUTHORIZE THE ENVIRONMENTAL PROTECTION AGENCY TO CONDUCT A STUDY FOR THE PURPOSE OF DETERMINING THE EXTENT TO WHICH RADON IN THE NATION'S SCHOOLS POSES A THREAT TO CHILDREN AND EMPLOYEES WITHIN SUCH SCHOOLS, AND FOR OTHER PURPOSES

AND

S. 744

A BILL TO ASSIST STATES IN RESPONDING TO THE THREAT TO HUMAN HEALTH POSED BY EXPOSURE TO RADON

APRIL 2, 1987

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RADON GAS ISSUES

WEDNESDAY, APRIL 2, 1987

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEES ON ENVIRONMENTAL PROTECTION AND
SUPERFUND AND ENVIRONMENTAL OVERSIGHT,
Washington, DC.

The subcommittee met, pursuant to notice, at 9 a.m., in room SD-406, Dirksen Senate Office Building, Hon. George Mitchell (Chairman of the Subcommittee on Environmental Protection) presiding.

Present: Senators Mitchell, Lautenberg, Graham, Chafee, Durenberger, Pressler, and Warner.

OPENING STATEMENT OF HON. GEORGE J. MITCHELL, U.S. SENATOR FROM THE STATE OF MAINE

Senator MITCHELL. Good morning, ladies and gentlemen. I would like to welcome you all to this hearing on issues related to radon gas.

The purpose of the hearing is to review the progress of the Environmental Protection Agency in implementation of radon programs and to hear testimony on bills addressing the radon problem introduced recently by myself and Senator Chafee.

I am very pleased to be working with my colleague, Senator Lautenberg, on this important issue. Today's hearing is being held jointly by the Subcommittee on Environmental Protection, which I chair, and the Subcommittee on Superfund and Environmental Oversight, which Senator Lautenberg chairs. We plan to schedule another hearing on radon issues soon.

Radon is a naturally occurring gas which seeps into homes and other structures and can build up to hazardous levels. Exposure to radon poses a significant threat of lung cancer, second only to cigarette smoking.

The Environmental Protection Agency estimates that as many as 20,000 lung cancer deaths each year are caused by radon. EPA also estimates that as many as 10 percent of the 85 million homes in the nation may have radon at hazardous levels.

In my home State of Maine, there is evidence of widespread radon contamination. Thirty percent of tests for radon in air exceed the EPA action level of 4 picoCuries per liter. Readings as high as 500 picoCuries per liter have been recorded in the State. Studies conducted by the University of Maine indicate that as many as 75 people in Maine die each year as a result of exposure to radon gas.

Last year, Congress enacted legislation, which I introduced, directing the EPA to conduct a national survey of radon, to demonstrate radon mitigation methods, and to carry out other needed research. This national level research is essential and must continue. We will be hearing more about the progress of this work later in the hearing.

There is, however, a need to complement this Federal effort with development of programs addressing radon at the State level. The increase in national attention to the radon problem has increased public demand for action. Much of this increased demand is falling on State governments. Many States lack the know-how or resources to conduct radon surveys or develop radon response programs.

My bill, the "State Radon Program Development Act," will direct the Environmental Protection Agency to expand technical assistance to States on radon issues and will provide seed money to help States get radon programs up and running.

States can use Federal assistance for a wide range of activities including surveys of radon problems, development of educational material, purchase of laboratory and related radon measurement equipment, and setting-up data management systems.

An authorization of $10 million is provided for fiscal years 1988, 1989, and 1990. The bill will provide short term support to those States which need and want the assistance. It will not provide grants to every State under a formula and is not intended to establish a permanent Federal grant program.

Officials from a number of States which have taken steps to address radon problems will testify on the status of their radon programs and provide comments on the proposed legislation.

We will also be hearing from witnesses on legislation addressing radon in school buildings, introduced by my colleague, Senator Chafee, the ranking Republican member of this subcommittee.

The Radon Detection in School Buildings Act directs the Administrator of the EPA to determine the extent of radon contamination in the Nation's schools. There is evidence of high radon levels in schools and we know that children are particularly sensitive to radon. This is an important aspect of the radon problem and I look forward to working with Senator Chafee on this issue.

In closing, let me say that these are important bills. We will consider changes to the legislation as may be suggested at today's hearing. And, I will work with my colleagues and with interested members in the House to develop the best possible bill, but I want to emphasize that I am determined to act promptly on this legislation. We intend to move this forward as aggressively as possible, because we believe that this action is necessary.

I would like to now yield to my colleague, Senator Lautenberg, who is chairman of the other subcommittee that is cosponsoring this hearing, and is cochairman of this hearing.

Senator Lautenberg, welcome.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. Thank you, Mr. Chairman. I am pleased to join with you in cochairing this hearing.

Today, we are going to take a look at EPA's implementation, and we will be hearing testimony on two bills, the one introduced by you, Mr. Chairman, and the other by Senator Chafee. I was pleased to join in their introduction, and I look forward to working with both of you on them.

I would like to say that I am concerned about the administration's commitment to radon. Yesterday, in an Appropriations Committee hearing, I questioned HUD Secretary Pierce about radon. The new Superfund amendments require HUD and EPA, jointly, to develop radon guidelines for housing officials.

So far, EPA and HUD have not entered into any agreement to meet this mandate. What makes matters worse is Secretary Pierce's lack of commitment. His answers yesterday showed a serious lack of knowledge or concern about radon.

The Administration is also attempting to weaken the new radon law through the budget process. It has proposed cutting EPA's radon budget at the same time it has proposed increasing DOE's radon research budget by $10 million. This cut contravenes the law's intention. The law puts EPA, not DOE, in the lead on radon. The cut also reduces the number of demonstration projects that can be done.

At the same time that we are seeing budget cuts, we are seeing missed deadlines. EPA has failed to submit two reports required by the new radon provisions. We have some school officials testifying here later this morning, and I think we can apply some of their terminology here. I give the administration poor grades for its attempts at meeting the mandates of the new radon law, and it has to improve.

We know that radon is a major public threat. It has been a threat in every region of our country; in almost every State. The EPA has stated that it could affect more than one million homes throughout the Nation. Radon is said to be the number two cause of lung cancer in this country, second only to cigarette smoking. As many as 20,000 lung cancer deaths each year could be attributed to radon.

In spite of the evidence of radon's threat—evidence verified through research around the world—most States have not taken steps to combat the problem. The two bills that we are looking at today will help provide States with the tools they need.

Senator Mitchell and I successfully placed radon provisions in the Superfund Amendments. The new bills that we are considering today expand on the mandate of the Superfund provision.

The State Radon Program Act would provide funds to assist States in developing their own radon programs. Those funds would serve a variety of purposes—training health officials, testing homes and public buildings, public information programs, and mitigation efforts.

The second bill, S. 745, directs the EPA to conduct statistically significant surveys of schools in each State, and this can help determine the threat posed by radon in those buildings.

Generally high radon levels are not expected to be found in public buildings. However, there are exceptions. Last year, a New Jersey school was tested and several hot spots were found. A survey of 140 Pennsylvania schools, located along the Reading

Prong, found 39 schools with problems there. These may be isolated, but when it comes to protecting the health of our children, we can never be too indifferent or industrious.

The program carried out under this bill will identify problem schools. When problems are identified, they will be taken care of. Radon is a problem that can be dealt with. Significant progress has already been made. With funding that I was able to secure for EPA, a mitigation demonstration program is being conducted in Clinton, New Jersey, where high levels of radon have been found. The results of that program are promising, but more can be done. The bills we are looking at today will help ensure that more is done.

I would like to touch on a third bill, S. 756, which I recently introduced. This clarifies that mitigation expenses can be deducted from income tax as medical expenses. This will help homeowners address the problem.

With these new initiatives, and tough oversight of the Superfund radon provisions, we can make great strides. I look forward to working with all of my colleagues on these bills.

I would like to note that the next panel will include Donald Deieso. Dr. Deieso is Assistant Commissioner for the New Jersey Department of Environmental Protection with whom I have done a lot of work. I look forward to his insights on New Jersey radon efforts and experience. I think that they will be of value to all of the Senators here. I welcome him as well as the other witnesses.

Thank you, Mr. Chairman.

Senator MITCHELL. Thank you, Senator Lautenberg.

We are pleased to have been joined by Senator Chafee, who is the former chairman of this subcommittee, and who has done more to protect the American environment over the past several years than virtually any other American. In the interest of time, I won't repeat all the other great things I said about you before you came in.

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Senator CHAFEE. I am sorry I missed it, but I will scan the record carefully.

Thank you very much, Mr. Chairman. I want to express my appreciation to you for pressing on with these hearings as you have in so many other matters that are of extreme importance.

Let me just say, since bouquets are being tossed here, you have done a superb job ever since you have been in the Senate and on this committee in taking the lead on so many environmental issues. I want to salute Senator Lautenberg also for his legislation, and his concern with this matter likewise.

What I would like to do, Mr. Chairman, in the interest of time, is to put my statement in the record, and to say that I hope that we can move ahead with this. Of course, we look to the active and efficient support of the distinguished Senator from New Jersey in connection with these matters.

Thank you, Mr. Chairman.

[Senator Chafee's statement follows:]

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

At the outset let me express my appreciation for the support of my colleagues, the Senators from Maine and New Jersey, for holding this hearing on the State Radon Program Development Act, and on a bill which I introduced, the Radon Detection in School Buildings Act.

The dangers of high levels of indoor radon contamination are no longer questioned by the scientific and medical communities. The Environmental Protection Agency cities radon as the leading cause of lung cancer among non-smokers, and estimates that it is responsible for up to 20,000 deaths per year. It is clearly time to address this problem.

The Radon Detection in School Buildings Act has a specific purpose. Unlike other legislation which addresses the problem of radon in private homes, this bill focuses specifically on the potential problem of radon in school buildings, and for very good reasons:

Children may be more at risk from the adverse effects of radon than adults. Studies of other types of radiation indicate that children, because they are still in the development stages, are more sensitive.

Radon experts believe that of all public buildings, one story elementary schools are the most likely to have a radon problem. Also, schools which utilize basement areas for cafeterias or gymnasiums are at risk.

A survey of 140 of these schools turned up 39 schools with recorded radon levels above EPA's recommended target level for remedial action. Children who are exposed at school may also be exposed at home, posing a significant health risk. I hope to hear informed testimony on all these issues today.

My bill authorizes EPA to conduct a statistical study for the purpose of determining the extent of radon contamination in the Nation's school buildings. Radon testing is relatively inexpensive, costing about $15 per test sample. This bill authorizes $1 million to conduct tests in a large sample of the Nation's schools, and $500,000 to test and perfect methods for ridding schools of radon, once it is discovered.

Senator Mitchell's State Radon Program Development Act and my Radon in School Buildings Act are relatively modest proposals that constitute the beginning of a national effort to deal with radon contamination. I am pleased to have this opportunity to receive testimony from, among others Mr. James Barnes, Deputy Administrator of the Environmental Protection Agency, and from the National Education Association. It is time we take steps to address the serious health risks posed by radon.

Senator MITCHELL. Thank you, Senator Chafee.

We are also pleased that Senator Graham was able to join us this morning.

Senator, do you have an opening statement that you wish to make?

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Senator GRAHAM. Mr. Chairman, thank you very much. I also appreciate the leadership which each of the members of the subcommittee has provided to this. I do have a statement, which I would like to submit for the record.

I regret that Dr. Lyle Jerrett, Director of the Office of Radiation Control for the Florida Department of Health and Rehabilitative Services was unavoidably detained and unable to participate as he was scheduled to do in these hearings. He has a written statement, and I would ask unanimous consent that it be included in the record. (See p. 99.)

[Senator Graham's statement follows:]

OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Messrs. Chairmen, thank you for the opportunity to hear testimony today on the status of our Federal and State radon programs, as well as on two important pieces of related legislation, introduced by Senators Mitchell and Chafee, respectively. I regret that Dr. Lyle Jarrett, who was scheduled to testify from my State of Florida, was unable at the last minute to get away. However, Dr. Jarrett, Director of the Office of Radiation control under the Florida Department of Health and Rehabilitative Services, has provided us with his written statement and I ask unanimous consent that his statement be included in the Record.

Radon poses a significant health threat in many areas of our Nation. Due to heavy phosphate deposits in Florida, my State experiences substantially high levels of radon in the environment relative to EPA's prescribed action level. With radon estimated as a cause of lung cancer second only to cigarette smoking, I believe it is incumbent upon Congress and the appropriate regulatory agencies to address prevention and mitigation of radon exposure in a timely fashion.

Florida has had a radon program in existence in Florida since the mid-1970's. We surveyed homes in the central Florida phosphate region, where high levels of radon were detected in approximately 20 percent of the residences. In 1980, we established a task force on phosphate-related radiation, to include a diverse group of participants in evaluating the extent of the problem and in recommending solutions. Final recommendations included development of State environmental radiation standards.

Florida promulgated a regulation in 1986 regarding exposure to naturally occurring radiation in the environment, becoming the first State to do so. The rule addresses standards for radon in new homes, schools, and public buildings. It also requires building specifications which incorporate radon-resistant materials and techniques in those areas of the State where radon exposure is a threat.

The State is now undergoing an extensive survey to determine the specific regions in which the rule is to be applied. A work group under the Department of Health and Rehabilitative Services is in the process of establishing long-term policy for radon mitigation and prevention.

Our State program merely touches the surface, thus illustrating the urgent need for the "State Radon Program Development Act of 1987", introduced by Senator Mitchell, and of which I am a cosponsor. Both the technical assistance provided by EPA under this bill, as well as the State grants, are necessary to allow States to go forward with or adequately continue surveys, training, and mitigation in regard to radon contamination. Senator Mitchell's bill would additionally complement the Research Program enacted by EPA last year.

Similarly, the "Radon Detection in School Buildings Act," introduced by Senator Chafee, requires EPA to assess the degree of radon contamination in our Nation's schools. Since children are especially sensitive to radon exposure, the testing and mitigation of radon in schools is absolutely imperative.

I thank our distinguished chairman and look forward to hearing from EPA and several States on the status of radon programs. I additionally am eager to hear witnesses' testimony on the two bills referenced above.

Senator MITCHELL. Thank you, Senator Graham.

Without objection, so ordered.

I would like to acknowledge a statement from the chairman of the full committee, Senator Burdick. We will make that statement a part of the record.

[The statement referred to follows:]

STATEMENT OF HON. QUENTIN N. BURDICK, U.S. SENATOR FROM THE STATE OF NORTH DAKOTA

Mr. Chairman, I am pleased to join you at this hearing on the serious health threats posed by exposure to radon gas.

I want to express my appreciation to Senators Mitchell, Lautenberg, and Chafee for their efforts to develop a national response to the radon problem.

Radon is an unusual problem for several reasons.

It is a natural element, rather than a man-made contaminant.

Unlike many of the pollutants we deal with, it occurs inside building rather than outdoors.

And, radon is among the most deadly pollutants we face. EPA tells us that as many as 20,000 people die of lung cancer caused by radon each year.

There is evidence of a radon problem in my home State of North Dakota. About 100 homes in the State have been tested for radon. About 30 percent of these homes have radon above the EPA recommended action level.

Radon is an unusual problem and dealing with it will require us to break new ground. Finding effective and responsible responses to radon will be difficult, but is a task we must attend to.

We have already made some progress.

Last year, we passed amendments to the Superfund bill which established a National Research Program on radon and other indoor air pollutants at the EPA.

Today's hearing will begin the process of developing additional legislation introduced by Senators Mitchell and Chafee.

I look forward to hearing testimony from our witnesses and working with other members of the committee to develop an appropriate response to the health threats posed by radon.

Thank you, Mr. Chairman.

Senator MITCHELL. Our first witness today is Senator Specter.

Senator, welcome. We look forward to your testimony. We know that this is a subject of great concern to you, that you have been involved in, and we appreciate your willingness to come here today.

STATEMENT OF HON. ARLEN SPECTER, U.S. SENATOR, STATE OF PENNSYLVANIA

Senator SPECTER. Thank you very much, Mr. Chairman. I am delighted to join you. At the outset I commend the distinguished Senators who are present for the leadership which they have shown, and especially for convening the first hearing on the subject of radon, which I believe is a matter of enormous national importance.

Mr. Chairman, I would ask that my full statement be included in the record.

Senator MITCHELL. That will be done. (See p. 8.)

Senator SPECTER. I shall summarize some of the highlights.

I first became concerned with the problem of radon when a Pennsylvanian by the name of Stanley Watras walked into a power-plant in December of 1984 and set the dials abuzzing. They made a check at the powerplant to see if there was any problem there, found none, and ultimately looked at Mr. Watras' home, and found that he was contaminated by radon.

I, then, made a trip in October of 1985 to the home of Mrs. Kay Jones, near Boyertown, Pennsylvania, and the radon level in the Jones household was equivalent to smoking 53 packs of cigarettes a day.

I made two other trips into the area. I went to Mr. Watras' home in January of 1986, and then returning in May of 1986, and continuing on to Bethlehem where a public housing project was stalled because of evidence of radon along the Reading Prong, which begins in Reading, Pennsylvania, and extends through New Jersey, on up into Connecticut, perhaps even to Maine through Rhode Island. Who knows how far the Reading Prong goes.

Senator CHAFEE. You have been able to get everybody's attention on this panel so far.

Senator SPECTER. That would get the attention of the panel. If the Reading Prong were sufficiently extensive to the west, south, and the north, it would get the attention of every Senator in the United States Senate, and every Member of the House of Representatives. I think that is a very, very important objective to be at-

tained, and I think that the legislation, which is currently pending here, and these hearings may accomplish just that.

A number of us worked together on the 1986 Appropriation Bill and got $2 million for EPA to do some research. Then many of us worked beyond that, on the Superfund Bill, to have the allocation of $5 million for each of three years, for this important subject.

We found that there was a problem in dealing with radon because it was not a manmade hazard. For a time, the consideration was only that manmade hazards ought to be the subject of the Environmental Protection Agency, and that, of course, is a specious distinction when you have a problem like radon. I think that we are finally on track on this very important subject.

I, too, am concerned about the Administration's commitment, and I believe that with the many problems that they face, we have to inform them about the problem and get them involved. Last year, Administrator Lee Thomas agreed to visit Boyertown, the Reading Prong in the spring of the year. That trip had to be deferred when Chernobyl arose. I have Administrator Thomas's commitment to come to Pennsylvania to take a look at the problem, and to see it first hand.

It is a matter of enormous magnitude and enormous importance. We have just seen the tip of the iceberg in some of the issues which we are concerned with today. I believe the legislation which is pending before this subcommittee is very important.

My staff and I are working on supplementary legislation. When we realize the full extent of the radon problem, I believe we will see the imperative nature of some very decisive action, really above and beyond anything which has been contemplated thus far.

Mr. Chairman, I thank you for the courtesies extended to me, and I would be pleased to respond to questions, or I would be pleased to let the next witness move the hearing along.

[Senator Specter's statement follows:]

STATEMENT OF HON. ARLEN SPECTER, U.S. SENATOR FROM THE STATE OF PENNSYLVANIA

Mr. Chairman, I appreciate the opportunity to testify before you today on radon contamination, an issue of past neglect, present danger, and growing public awareness.

I want to commend you for holding this hearing—the first ever held in the United States Senate on this issue—and for joining in the battle against radon with the introduction of your legislation, S. 744 and S. 743. It is my understanding that you will be hearing from a variety of officials on the bills, so I would like to offer some insights based on my personal experience with the radon problem.

While the scientific and medical communities have known about the danger of radon for some time, only recently have we become aware of the seriousness of the matter for homeowners. In December, 1984, Mr. Stanley Watras of Boyertown, Pennsylvania, an employee at a nuclear power plant, set off radiation alarms when he walked into work one morning. After no evidence of on-the-job contamination was found, it became clear to health officials that Mr. Watras was contaminated at home.

It was soon discovered that Boyertown lies in the "Reading Prong," a natural formation of uranium deposits running northeast from Reading, Pennsylvania into New Jersey and elsewhere. On my first vist to the area, in October, 1985, at the home of Mrs. Kay Jones, I witnessed the highest level of radon contamination ever recorded at the time. The level, recorded by an EPA official, was equivalent to smoking some 53 packs of cigarettes a day.

Needless to say, Mr. Chairman, this event had quite an effect on my perspective of the problem. I since have visited the Reading Prong twice more, and have found

that residents there generally knowledgeable about the radon problem, and in many cases have tested their homes and begun to take remedial action.

Unfortunately, it is clear from recent scientific studies that radon contamination is not limited to the Reading Prong of the Northeast. As more an more states throughout the country discover radon problems, the Federal government must be prepared with a strategy and a program to assist them.

In the Superfund amendments passed in the last Congress, EPA was given authority to begin a radon program, including a national survey. The nature and extent of the problem, however, require a more aggressive and comprehensive approach. As a cosponsor of S. 743 and S. 744, I am hopeful that we are moving in this direction.

In conclusion, Mr. Chairman, this hearing comes at an appropriate time. The EPA recently has released a report, "Unfinished Business: A Comparative Assessment of Environmental Problems," which identifies radon and the larger issue of indoor air pollution as problems that have not been addressed adequately. I look forward to working with the members of this committee to ensure that radon contamination is treated as a priority issue during the 100th Congress.

Senator MITCHELL. Thank you, Senator Specter. We appreciate that. Your interest and help in this area are very well known, and we look forward to working with you on this legislation.

Do any of the other members of the panel have any questions?

Senator LAUTENBERG. Just to compliment my colleague from Pennsylvania for his interest, and his aggressiveness in the pursuit of the solution to this problem. Unfortunately, Pennsylvania and New Jersey have an abundance of this material.

The discovery that was made shocked all of us. It caused us to look beyond just the Reading Prong to discover, to our dismay, that this material is not confined to only this area.

Senator Specter's comments about where the Reading Prong might extend to; unfortunately, we can find radon in 45 States across this country. That is why, Mr. Chairman, I think that with the interest of our colleagues in the Senate, this legislation is going to be enacted, it is going to be enforced.

We are all going to be demanding of EPA, as we just heard Senator Specter and Senator Chafee say, to do the job that Congress has mandated. We wiil feel a lot better about our children in the schools and in their homes. I believe that we can do what is necessary to protect the health of our families, and this is certainly one way to do it.

My compliments, Senator Specter.

Senator MITCHELL. Thank you, Senator Lautenberg.

Senator Chafee.

Senator CHAFEE. I do not have any questions, Mr. Chairman.

Senator MITCHELL. Senator Graham, do you have any questions?

Senator GRAHAM. No, thank you, Mr. Chairman.

Senator MITCHELL. Thank you very much, Senator Specter. We appreciate your testimony.

We are pleased that Senator Warner has been able to join us.

Senator, do you have a statement that you wish to make?

OPENING STATEMENT OF HON. JOHN W. WARNER, U.S. SENATOR FROM THE STATE OF VIRGINIA

Senator WARNER. Mr. Chairman, I see one of our colleagues from Tennessee is waiting. I will put my statement in the record.

My State has quite an active program of its own, and we are anxious to learn what other States are doing, and what EPA proposes to do. I will ask that my full statement be inserted in the record.

Senator MITCHELL. Thank you, Senator Warner. Without objection, that will be done.

[Senator Warner's statement follows:]

OPENING STATEMENT OF HON. JOHN W. WARNER, U.S. SENATOR FROM THE STATE OF VIRGINIA

Thank you, Mr. Chairman. I would also like to thank the various witnesses who have taken the time to appear before this committee today to discuss this important issue.

I would also like to express special thanks to the state and local officials who have traveled great distances to tell the Committee first hand of their experiences in dealing with this problem.

The problem of radon contamination in homes and public buildings is indeed a significant public health threat to those individuals residing or spending significant amounts of time in affected areas.

The Environmental Protection Agency estimates that as many as 20,000 lung cancer deaths each year may be attributable to radon contamination.

It is important for us to recognize the potential threat that radon poses.

I welcome the opportunity today to learn more about the Agency's plans to initiate a national survey due later this year to assess the overall dimensions of the radon problems, as well as a major study on radon issues due in late 1988.

This Committee would particularly appreciate the Agency's views on the State Radon Program Development Act and the Radon Detection in School Buildings Act before us and how these proposals might compliment the Agency's ongoing efforts.

Finally, I am interested learning the opinions of the various State witnesses today on such issues as:

1. Their assessment of the overall scope of this problem nationwide.
2. The experiences of the states who have had the most active role to date in implementing the program, and their reactions to EPA's current technical assistance efforts.
3. The role that other Federal agencies, such as the Department of Energy, will play in this program and how EPA has coordinated its activities with DOE.
4. In the longer-term, the role that the Federal, State and local governments should assume in implementing the program.

Again, Mr. Chairman, I join you in thanking our witnesses for providing us with the benefit of their experience. I look forward to their testimony.

Senator MITCHELL. The next witness will be Senator Gore.

Welcome, Senator. We look forward to hearing from you.

STATEMENT OF HON. ALBERT GORE, JR., U.S. SENATOR FROM THE STATE OF TENNESSEE

Senator GORE. Thank you very much, Mr. Chairman. I am very pleased to be here.

I want to congratulate you and the two subcommittees' for your leadership on this issue. I am grateful for this hearing, and proud to be an original co-sponsor of the radon bill that you have introduced, along with the ranking member of your subcommittee, Senator Chafee. I am also supportive of his bill to measure radon contamination in schools.

I would like to single out the chairman of the other subcommittee having these hearings, my distinguished colleague, Senator Lautenberg, for his diligent efforts in environmental oversight. I would like to express the hope that the Senate will have the opportunity to act quickly not only on the two bills under discussion this morning specifically, but also on Senator Lautenberg's bill to allow medical care tax deduction for necessary home improvements to

remove radon gas. I am proud to be a cosponsor of that legislation as well.

I have a very short statement, Mr. Chairman. Tennessee is one of the areas in the south where there is a very large pocket of radon gas. Many people are understandably quite concerned about it. Radon is an insidious and illusive national problem. We simply cannot ignore the recent EPA report identifying radon exposure as the second greatest cancer risk of all environmental problems in this country. In fact, it may well be the most severe air pollution problem in America today.

Radon is a particular health hazard in my home State, as I mentioned, in the middle part of the State in particular. EPA surveys have shown that Tennessee is one of 10 States with the most high risk radon areas. As a result, Tennessee is one of several States to receive EPA assistance in conducting surveys of indoor radon levels in homes.

Tennessee has been conducting sampling surveys across the State, and so far the results have been very disturbing. Of the first 500 homes studies, more than a quarter had radon levels equal to 200 chest X-rays per year. The scientists say that that is at the four picoCuries per liter level. One home outside of Nashville had a level 15 times greater than the EPA safety limit.

How do we put this risk into perspective?

I would say, Mr. Chairman, and members of these two subcommittees, that part of the problem we face here is that over the years the American people have been notified about a number of cancer risks such as saccharine, and other risks that when eventually quantified have lead them to back off and say: Well, maybe that is not such a big deal after all, and I am willing to run that kind of a risk.

Radon is different. How do we get that message across? It really is in a different order of magnitude where the risk to human life and health is concerned.

Another problem in putting it in perspective is, that it does exist in pockets. While, in Tennessee, for example, most of the State faces no such risk at all, there are substantial areas of the State that can be delineated, where the risk is extremely high. It cries out for national leadership of the kind that these two subcommittees is providing in today's hearing and in the consideration of the legislation that you have before you.

Our State has not yet completed its survey, but already the obvious question is being asked: What do we do? Identifying the problem is only half the battle. We can't stop there, obviously. I have written to EPA Administrator Lee Thomas, asking for assistance in providing a radon diagnostician and mitigation training program in Tennessee this year, not next year.

Early results from the State-wide survey suggest that extensive mitigation measures will be necessary, just as a matter of prudence, in many Tennessee homes. As you might expect, however, expertise in this area is extremely limited in the State, indeed, and in the entire region. Training of State and other professional personnel is critical.

Currently only two training courses are scheduled to be offered for the rest of the year, one in New Jersey, and one in New York. I

believe that a training course conducted in Tennessee sometime this summer would be essential in order to deal with the widespread public concern that is certainly going to follow the release of the final State survey.

Finally, Mr. Chairman, I would like to ask the members of these two subcommittees to consider legislation to allow EPA to charge companies for certifying radon testing services. The agency expects to have 600 requests in the next cycle from companies that want to engage in radon testing. EPA needs legal authorization to charge them roughly $1,000 a piece for certification which would be used to set up a revolving fund.

Mr. Chairman, again, let me thank you for the opportunity to appear in this hearing this morning. I wish the two subcommittees well in their extremely valuable and important efforts to deal with the vast and largely invisible problem of exposure to radon gas.

Senator MITCHELL. Thank you very much, Senator Gore. We appreciate your testimony and your support in this area. I have no questions. I will ask Senator Chafee.

Do you have any questions?

Senator CHAFEE. No.

Senator MITCHELL. Senator Lautenberg?

Senator LAUTENBERG. Nothing, Mr. Chairman.

Senator MITCHELL. Senator Graham?

Senator GRAHAM. No questions.

Senator MITCHELL. Thank you very much. We appreciate your willingness to be here.

We will place a statement from Senator Proxmire in the record at this point. He is very interested in this subject and planned to attend the hearing but an unavoidable conflict kept him away.

[Senator Proxmire's statement follows:]

STATEMENT OF HON. WILLIAM PROXMIRE, U.S. SENATOR FROM THE STATE OF WISCONSIN

Mr. Chairman, thank you for allowing me to submit testimony on the subject of radon and radium in the environment. This extremely important subject has not been adequately addressed by EPA and clearly merits further study and action on the federal level.

However, I am concerned that the proposed legislation may not consider the chief radiation problem in Wisconsin, radioactive drinking water. At least 46 Wisconsin communities with a total population of over 200,000 people fail to meet the proposed standard for radionuclides in drinking water to be finalized by the end of 1988 under the Safe Drinking Water Act.

The Wisconsin communities affected by radon and radium polluted drinking water have very few options regarding cleanup. No grant program addresses their needs. Even worse, accurate information on the types of cleanup, their costs and technical problems is hard to locate. Differences between various isotopes of radium, radon and uranium complicate efforts to control these substances.

Radon in the air and radium in the groundwater often go together in Wisconsin and elsewhere in the United States and result from the same cause-high levels of radioactivity in the bedrock. Therefore, it makes sense to look at both problems at the same time. This is especially true since such water uses as showering with radium-contaminated water can liberate radon into the air, changing the problem from water pollution to air pollution.

Unfortunately, small municipal water companies and individual wells supply most of the water in the areas of Wisconsin which suffer from this problem. They often don't have the resources to install costly water treatment systems necessary for radiation removal, costs which for Wisconsin alone could top $50 million. Nor do they have the expertise to evaluate the best treatment methods.

Federal legislation could make a big difference in easing the problems of my constituents, especially if it is coordinated with the Environmental Protection Agency's

National Inorganics and Radionuclides Study due for publication later this summer. The report includes a sampling survey of 1200 public water systems nationwide and contains radium sampling data. It will indicate for the first time the magnitude of radiation in the nation's water supply.

The Committee should also consider the problem of radioactive sludge created by removing radium from drinking water and the best methods for disposing of this sludge.

Finally, the Committee should consider ways to improve scientific methods for measuring the amount of radioactivity in drinking water. Most Wisconsin communities exceed the proposed standard by only small amounts and inconsistencies in measurement affect whether communities violate the radiation standard. Bills before the Committee dealing with technical assistance for radon-affected communities should be expanded to include technical assistance for measurement.

Senator MITCHELL. The next witness is Mr. A. James Barnes, Deputy Administrator of the Environmental Protection Agency.

Mr. Barnes, as always, we welcome you here. We look forward to hearing your testimony today, and working with you in this area. We ordinarily have a five minute rule for witnesses. It will be imposed on future witnesses, but, Mr. Barnes, since you represent the Administration, and I believe have much to offer us in this area, we will just suspend that. Take what time you need to make your statement.

STATEMENT OF A. JAMES BARNES, DEPUTY ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY

Mr. BARNES. Thank you very much, Mr. Chairman. I am delighted to have a chance to appear before the subcommittee today and discuss an issue that is very much of concern to the American people and EPA.

In our testimony we have set forth a rather extensive discussion about where we are with the radon program, and I would like to submit it for the record. I appreciate your indulgence in going beyond the five minute rule. I think I can make my comments fairly brief in terms of what EPA's strategy is, where we see we are now, and what are some of the steps on the immediate horizon for us? Then I would like to offer a few observations on the legislation which you and Senator Chafee have introduced.

Senator MITCHELL. Mr. Barnes, your statement will be inserted in the record and we look forward to hearing from you.

Mr. BARNES. As I begin this morning, I really would be remiss if I didn't reflect back on the time about two years ago, when Lee Thomas and I were having our confirmation hearings, Mr. Chairman, and you asked both of us if radon wasn't a much more serious problem in the country, warranting more aggressive activity on behalf of EPA, than had been true in the past? We indicated to you that what we had seen about the risks from radon led us as well to believe that it was a problem that warranted increased attention.

We promised you that we would examine the question. Since that time we have adopted a national radon strategy and we have taken rather vigorous action pursuant to that strategy. There has been a great deal of, I think, very positive effort on behalf of a number of States, some of whom you will be hearing from today, the private sector and other Federal agencies.

I believe it may be instructive to very briefly review the objectives of our radon strategy. We are seeking to utilize the resources available at the Federal-level, at the State-level, in the private sector, and to put together a partnership, using the strengths and particular contributions that each level can make.

We have four major elements to our program. The first is to assess the problem. Second, mitigation and prevention activities. Third, building the capability in State and local governments to work with individual home owners and fourth, the development of public information. I would just briefly highlight a couple of the things that we have underway on each of these fronts.

In terms of assessment of the problem, we have had requests from approximately 24 States to assist them in doing surveys of the potential problem in their state. We have efforts underway with 10 States this winter, and are hoping to be able to assist a similar number this next winter.

We are also well into the planning stage of the national survey that we have been working on and which, in the SARA Amendments, you had required the Agency to carry out. We anticipate taking the survey very shortly to the SAB, our Scientific Advisory Board, to have them review it to make sure they are comfortable with the methodology that we will be using. We anticipate that later this year we will have in place the cannisters to follow through with the survey.

We have established the Radon Measurement Proficiency Program whereby people that believe they have the capability, the capability to measure for radon can come to us, and we can certify whether we believe they indeed have that capacity to accurately measure radon.

In the second area of mitigation and prevention, we have two major efforts. One, the Mitigation Demonstration Program, where we actually demonstrate and evaluate selected mitigation techniques in homes. We also have a second program, where we work with states to help them assess health problems in homes, to develop proposed mitigation plans, and then come back to assess the success of the implementation of those plans.

Third, in the capability development area, we have been working with a number of States to build their State infrastructure and ability to work with private citizens. Senator Gore mentioned the training course that we have developed and given a number of times across the country. We anticipate going forward with additional training courses and we are about to complete a videotape of the training course that will rapidly expand our ability to make this information available.

And fourth, on the public information front, the items that I would highlight there are the citizen brochures that we developed in consultation with other Federal agencies and the State agencies.

The first is the Citizen's Guide to Radon: What The Citizen Needs To Know About It and What He Or She Can Do About It. A second booklet provides information to the homeowner about radon reduction methods.

A third guide of radon reduction techniques that provides technical guidance for State officials and contractors. It provides the detailed guidance they need to be able to mitigate houses.

And, we have two other brochures that we will coming forward with shortly. One is: A Citizens Guide To Radon Reduction In New Construction. And finally, a radon in drinking water brochure.

The main focus of the hearings this morning, after the review of where EPA is, is, of course, the focus on the two pieces of legislation that have been introduced.

Mr. Chairman, taking first your bill—the State Radon Program Development Act. We were very pleased to see that it recognizes that there are some distinct roles that the Federal government needs to play, that the State government needs to play, and that you recognize the very critical need to build State capacity.

Our experience to date, particularly with New Jersey and Pennsylvania, shows that State capacity is a very critical element in the government's ability to deliver successfully to citizens and to respond to their needs and concerns. You are, with respect to the provisions in your bill calling for a variety of EPA assistance, technical assistance, and provision of information.

We generally agree with the areas of EPA assistance that you set forward. We do have a couple of areas where we would questions whether the role for the Federal government should be quite as strong as set forth, however, I would view comments here as relatively minor suggestions.

We are attracted to the idea of fees that Senator Specter put in his bill, and that Senator Gore mentioned in the course of his testimony. Because of its success our Radon Measurement Proficiency Program is taking a lot more of our resources than we had anticipated. A mechanism for allowing the charging of a fee there, that would come back to the Agency and make it a self supporting program, is attractive.

On a second aspect of your legislation, that relates to grants, we have indicated that we have some concerns. I think that your bill does fairly set up the question of how you structure the grants so as to be able to provide an incentive to a State to get a program underway, and at the same time not create an expectation on the part of the State, that there will be a continual or long-term Federal grant program that is going to be available to States across the board. We would be pleased to discuss some of our ideas on that front further.

Again, overall we are very pleased at the thrust, and what we think is the complementary nature of your legislation, compared to the approach that we have taken to date.

With respect to the legislation that Senator Chafee has introduced—the Radon Detection in School Buildings Act—we would agree with Senator Chafee and those of you who sponsored this legislation that it is important to look at the question of the presence of radon in schools.

We see the thrust of this legislation, again, as consistent with the overall approach that we have taken in terms of one trying to identify where the high risk areas in the country are. This facet is important, not only with respect to residences, but also to schools and other kinds of buildings.

Second, the requirement that we design a survey of schools to enhance our knowledge about where and in what level radon can be found in schools, and that we provide canvassers and technical as-

sistance to States to be able to conduct that survey, again, I think, is very consistent with the approach that we have taken.

The work that has been done to date, in Pennsylvania and New Jersey, confirms that we are finding radon in schools. We are somewhat heartened to find we have not found the extreme outlier levels, that we had found in some homes in the same areas. But, nonetheless, the levels are of concern, because we have young people spending a considerable amount of time in the classroom during the day, and being exposed to radon at an early stage in their life.

The third element of the legislation goes to diagnostication and remediation efforts in selected schools, again, we believe this is a critical element in any effective programs to address radon problems. We need to look at how school buildings may be different from the residences that we are looking at. Then we need to evaluate which remediation techniques will be successful with schools, and then have a mechanism for transferring that knowledge to the Sates and in turn to the school districts.

With these comments, Mr. Chairman, I will stop. We do have some small technical comments that our staff would be happy to work with yours on and, as you work on the legislation, we would be very interested to work with you on it as you pursue this very important public health issue.

Senator MITCHELL. Thank you very much, Mr. Barnes, for your testimony and your cooperation. I will begin the questioning, and we will limit the first round to five minutes each in the order that the Senators appeared. We will continue until all questioning has been completed.

Mr. Barnes, are you opposed to grant assistance to the States of any sort whatsoever, or might you be willing to support a grant assistance in some form, different than that proposed in my legislation?

Mr. BARNES. Mr. Chairman, I am not opposed to grant assistance in any form. The form of assistance we would have the most difficulty with would be setting up a new program that sets up an entitlement for all States across the board.

It is my understanding that really is not the intent of your legislation. I think, that an area that, at least from the point of view of our agency, we would find it might be possible to support is legislation that would be targeted or aimed at providing seed money to get a State over the hump, to get a program set up and running, but done in a way that doesn't create an expectation on the part of the State that that Federal money is necessarily going to continue, or that the State will reduce its level of support once the Federal seed money is not still there.

Senator MITCHELL. So, might I draw from your answer, that you may support, for example, a one-year as opposed to a three-year program, and one which required that any Federal assistance be in addition to prior State's programs, and not a substitute for?

Mr. BARNES. Yes. Some of the thoughts that we have had, Mr. Chairman, would be making it, for example, clear that a State only would be eligible one time for a grant, and not perhaps, several times over a continuation of years. There is also a question of whether a grant, perhaps, should last more than one year, but that

there might be some stepping down of the Federal contribution over the course of that grant, so that there is a natural progression from the Federal to the State taking the program.

Senator MITCHELL. Thank you. We look forward to working with you on that aspect of it.

You have suggested that action be taken to mitigate radon at levels above 4 picoCuries per liter. This action level allows a cancer risk of roughly 3 deaths out of 100 individuals exposed, which is much higher than is generally accepted for other environmental programs.

Are you confident that the action level of 4 picoCuries per liter is adequate to protect the public health?

Mr. BARNES. Mr. Chairman, it is important to understand, as you pointed out, that that action level that we have put forward is based on our assessment that the technology at this point does allow us to bring the radon levels in a home down to that level using the techniques that are currently available.

We think it is important that as we get more experience with technology, that if we are able to do better than that, then we should do it, because certainly the residual risk at that level is higher than the risk we accept in other programs that we have. But, I might add, that the risk that you and I run from radon in the outdoor air of about 1 in 1,000, is also higher than we would have under many of the regulatory programs that we have in place.

We have some unusual aspects to radon, and we think, we ought to do as well as we can now, and then keep looking to see whether there are ways that we can do better.

Senator MITCHELL. In more completely responding, the agency has said, that the practical difficulties in reducing radon below the action level of 4 picoCuries per liter were what lead it to establish it at that level.

My question on that is: How did you determine the level at which reductions were difficult to achieve? That is, it seems to me, necessarily a subjective judgement.

Mr. BARNES. Yes. It was based on experience that the agency and States have had, for example, dealing with the question of uranium mill tailings in Colorado, the efforts in Florida to deal with homes built on phosphate mines, and the very early work that we were doing to try to mitigate against radon in the home problem in the Reading Prong area.

Senator MITCHELL. You indicated also in your earlier answer that, if there is further development of technology that would make it more feasible to reduce the action level, you would consider it at that time.

Do you have any research underway to help develop technologies to accomplish that objective to permit a reduction in the action level?

Mr. BARNES. Of course, the basic thrust of our Mitigation Demonstration Program is to look at what it is possible to do, using a variety of mitigation techniques from sealing cracks to increasing the air exchange rate, and so on. I think, as we look at the experience from the mitigation too, there might be reason to reevaluate or reassess that level.

Senator MITCHELL. I am not asking so much about the experience from that type of research, but whether or not you have research specifically devoted to new technological developments, which then might permit a reduction in the action level.

Mr. BARNES. I have been reminded of one other area. We are doing work with construction techniques for new homes, that again may offer us some insight as to what it is possible to do, starting at square one in terms of construction of a home, to have that level lower.

Senator MITCHELL. Should further research indicate that the health risk is greater than presently believed, would you then also consider revising the action level?

Mr. BARNES. Yes, Mr. Chairman, but I think that the difficulty that one runs into there is telling the people: Yes, you are running a risk that ought to be unacceptable, but there isn't anything we can tell you you can do about that level. I think, that is a very difficult problem to take on.

We tried to address the issue in our radon brochure. We included a chart that showed people the range of risks that they would run from being exposed to various levels of radon. We did not stop that chart at the 4 picoCuries per liter level, but took it down to lower levels and showed them what the risk would be from average indoor levels and average outdoor levels—so that we did try to provide them with some information on putting those risks in perspective, including the one at the lower action level you are suggesting.

Senator MITCHELL. My time is up. I will get back to that, because one of the things that I am concerned about is a reduction in the level of funding for research at a time when I think that we need to be doing more research, but I will now go to Senator Lautenberg.

Senator LAUTENBERG. Thank you, Mr. Chairman.

Welcome, Mr. Barnes. I was interested in the comment that you made about the levels of outdoor radon possibly being higher than we would like to see.

Is that a fairly recent discovery? Is radon, not only indoors, but outdoors, a dangerous material?

Mr. BARNES. I think, Mr. Chairman, maybe the reverse is true. People have known for a long time that people were exposed to radon in the outdoors environment. The new discovery really has been the levels inside that have turned out, in some cases, to be much higher than we had previously anticipated.

For example, the incident that Senator Specter referred to involving Mr. Watras, and the experience that we have found in your community of Clinton, that just showed the levels at 2,000 picoCuries per liter, we didn't anticipate that we were going to find that kind of levels that high inside homes.

Senator LAUTENBERG. There has been a fair amount of attention given recently to my home town of Montclair, New Jersey, where we have a manmade radon problem resulting from deposits from manufacturing companies. Suddenly we discovered that it would not be a good idea to have children, or adults, exposed to the outside air, where this material rests. I think, that is a relatively new realization, if it is not a brand new discovery, of the magnitude of the danger.

Mr. Barnes, I want to talk about HUD's radon activities. Superfund Amendments require HUD to work with EPA on developing national guidelines on radon. Yesterday, I talked to Secretary Pierce. He didn't seem to be concerned about it, as you probably heard in my opening remarks.

I would like to know why EPA hasn't entered into an agreement with HUD for meeting new law mandates?

Mr. BARNES. Mr. Chairman, we have had some meetings with HUD. In fact, we have met with them over the past couple of years, as we talked about the general thrust of our indoor radon strategy. So, we are not, at least on our end, sitting still in pursuing the issue with HUD.

I don't think it would be fair to say that nothing is going forward in terms of work on new construction, irrespective of whether we have an agreement yet with HUD. We have been doing a lot of work with homebuilders and with several States, in terms of model building codes, in working on the new construction problem.

We are going to continue to work on the HUD front, to try to utilize their network and to provide them information that they can crank into some of their programs.

Senator LAUTENBERG. But, HUD represents the Federal Government and has a stake in properties. It may be subsidized housing, mortgages, financed property, whatever. If people decide to abandon these properties in the interest of their health, we certainly could understand that. Then, we wind up having spent money and having provided facilities that obviously can't be used.

I heard what you said about new construction, but I am talking specifically about the agreement between HUD and EPA. You say, "Nothing has been done," then we talked about new standards for new construction.

Can you tell me what has been done with EPA and HUD in terms of developing a standard or an agreement that we can look at and say: We now know what we have to do with HUD to make certain that these buildings are radon free.

Mr. BARNES. Mr. Chairman, my understanding is we have had a number of meetings over the last several months with HUD. I would be glad to provide you with a more complete answer for the record.

I just want to reiterate from our end that we are committed and determined that we are going to follow through and work with them on to the end that you have asked us about.

Senator LAUTENBERG. Have you found them pursuing this agreement? Do your people know how much contact has been initiated from either side, so that we have some sense of where we're at?

Mr. BARNES. Shelly Myers, who is our Director of our Office of Radiation Programs, is here and was directly involved in the meetings with HUD.

Mr. MYERS. We did pick up, as Mr. Barnes has said. We have been working with HUD over the last couple of years, but as a direct result of the SARA Amendments, we initiated further efforts with the radon staff at HUD, and literally, a couple of weeks ago, sat down with them to start laying out the framework of an agreement that would accomplish the ends that you have intended in that law.

Senator LAUTENBERG. You started working with them a couple of weeks ago, but you say the contact has been going on for a couple of years. So, can you account, Mr. Myers, for the pace at which this is moving? You are finally having a meeting two weeks ago, after a couple of years of contact.

Mr. MYERS. The work over the past several years has been to learn from them how best to translate the technology we are developing into building codes, as Mr. Barnes already said. Also, recommendations to deal with homebuilders associations and the National Association of Realtors, and we picked up on that as well, as a result of several meetings over the past couple of years.

The meeting I mentioned a couple of weeks ago was specifically related to the SARA Amendments, so that we could then put together a memorandum of understanding as to how we would follow through per those amendments.

Senator LAUTENBERG. My time is up.

Senator MITCHELL. Thank you, Senator Lautenberg.

Senator Chafee?

Senator CHAFEE. Thank you, Mr. Chairman.

Mr. Barnes, I think, we all have a feeling on this panel that out of nowhere comes this radon problem, and yet, it must have been around previous to our being alerted to it.

For example, what have other nation's done? Obviously, this can't be something peculiar to the United States. Let's take the Swedes, they seem to be alerted to all kinds of problems. What have they done, or do they suffer from the same difficulties?

Mr. BARNES. You are quite correct, Senator Chafee, that this is not a problem limited to the United States. It is one that is increasingly getting more attention in Europe, with the Swedes probably being farther out ahead of other countries.

My understanding is that the Swedes have generally adopted a fairly long-term approach to dealing with this issue, focusing primarily on new construction, and setting themselves a goal over the next 40 or 50 years of reducing the radon levels by half.

Senator CHAFEE. How many years, 40 or 50 years?

Senator LAUTENBERG. They won't have to cure those problems if it takes 40 or 50 years.

Mr. BARNES. I said 40 or 50 years? It is over 100 years.

Senator CHAFEE. That is what you call a "gradual approach."

Let's not look to the Swedes for a solution.

Let's look someplace else.

Senator LAUTENBERG. Try the Norwegians.

Mr. BARNES. I just recently had some conversations with officials in Great Britain. My assessment is that they are well behind us on this issue. They are just going out, starting to look and see if they have a radon problem.

Senator, again, as I indicated in my answer with Mr. Lautenberg, we have known that there are radon problems in the environment for a long-time. We knew we had some specific problems related to phosphate mining areas and uranium mill tailing areas. We didn't realize the kind of problems we might have on a broader scale indoors.

Two years ago, that realization was just dawning on us, and I think we have put in place, in the last two years, a rather impressive array of tools and efforts to try to get at this problem.

Senator CHAFEE. I am not belittling the activities of your agency at all. I think, that every problem that comes up, whether it is Superfund, or hazardous waste clean up, or clean water or whatever it is, we say, "give this top priority," and there are only so many things that can be given top priority.

Let me ask you, what basis do these statistics come to us, that 4,000 to 20,000 deaths per year in the United States from lung cancer derived from radon? I have been repeating these statistics, myself, with great vigor, but I am not sure where they come from.

Mr. BARNES. Essentially, we have taken the studies that were done on uranium miners in the western States, and used that as a basis for doing a risk assessment. Then we subjected that risk assessment to review by our Science Advisory Board. That came to us and told us that they thought the risk ranges that we were working with were reasonable and in keeping with what they viewed as the best view of the science and risk information at this point in time.

Senator CHAFEE. The statistics in your statement say 4 pCi per liter is what you think is safe, and yet, in some homes, you are finding 1,000 pCi.

Good Lord, how can somebody spend the night there without incurring severe disability. How can that be? How can somebody survive in a 1,000 pCi environment?

Mr. BARNES. A couple of comments. One, the risk that we are talking about is that of developing lung cancer, which is essentially a fairly long latency disease. But, you are quite correct, that where we see those very elevated levels, we have a very strong concern, that continued exposure at those levels means individuals, in our judgement, could run a very high risk of developing lung cancer later in their lives.

Senator CHAFEE. It seems to me, there are two things that show promise. One, in your statement, you talk about following the geological patterns of the Nation, and identifying where radon occurs in certain rock structures. Now, you have the geological patterns, probably, you have that information. That seems encouraging.

Secondly, it seems to me, we might well attack this through the building codes, and you touched on that briefly. Of course, that only refers to new homes.

Is any State looking at that prospect? Just as there are inspections for the adequacy of the electrical wiring in a home, so you might have it for PERC tests, so you might have it for radon?

Mr. BARNES. Yes. Our understanding is that there are a number of States that are looking at the building code issue. I think, the experience that we are getting working with new homes in New York, and New Jersey, and other parts of the Reading Prong will give us some additional information as to how those requirements ought to be structured in a building code.

If I might just make one further comment on your first point, we are encouraged, as you suggested, in our ability to take a look at geologic formations as a predictor of where we may find the higher radon levels.

One of the things that has been helpful is that many more measurements are now being taken, and we are trying to correlate that information with information that we have about geology, and there does seem to be a positive pattern developing.

Senator CHAFEE. My time is up. Thank you, Mr. Chairman.

Senator MITCHELL. Thank you, Senator Chafee.

Mr. Barnes, last year in the amendments to the Superfund, which Senator Lautenberg and I coauthored, the Congress wrote into the law, provisions which direct the EPA to expand its research on radon, and specifically directed EPA to take the lead in radon research.

The Administration's budget this year, proposes a 50 percent reduction in EPA research in this area, and a $10 million or very large increase in research funding for DOE.

Why is not EPA in charge of radon research? In fact, I am further told, and I am going to ask you to confirm this, that DOE didn't even ask for any radon research money, and the Office of Management and Budget gave it to them. Took it away from EPA and gave it to DOE even though they didn't ask for it.

So, I would like to ask you a series of questions. First, is that true, what I just said. I have been told about the funding of research, and why is DOE being put in charge and given such a big increase, and EPA being cut back?

Mr. BARNES. Mr. Chairman, I cannot speak of my own knowledge to the first question you have asked. As to whether there was a DOE request for that money, before the Office of Management and Budget, before that appeared in their budget, I would say, we do not begrudge that the Department of Energy has money for research.

We found over the past few years that they have had a very good research program that has contributed considerably to our understanding of this problem. They have concentrated primarily on the basic research area. We think we do need better information about how radon moves through soil, so we can help, for example, design mitigation efforts and we need better answers on some of the health aspects.

So, that there is work to be done on that front as well as on the applied research front, which is where EPA's efforts have been over the last few years.

Senator MITCHELL. What I am asking you, if you are able to state, what is the rationale?

What is the reason for cutting EPA's research funds in half, and providing an increase for DOE of several hundred percent, immediately following a law passed by Congress, signed by the President, which directs EPA to expand its research, and to be the lead agency. It seems to me to be directly contrary to what the law calls for.

Maybe we made a mistake in calling for that. What I am asking you is: Why is the Administration doing this? What is the reason for it?

Mr. BARNES. You have fairly put the question Mr. Chairman. I am not able, of my own knowledge, to shed any light on that issue.

Senator MITCHELL. Who do you think I should ask?

Mr. BARNES. Perhaps the Director of the Office of Management and Budget.

Senator MITCHELL. That is what I was afraid you were going to say.

I think that answers the series of questions right there, Mr. Barnes.

One of the purposes of the research plan called for in the Superfund Amendments is to lay out the various radon research activities of all Federal agencies and describe or explain how they form an overall pattern. The draft plan does not describe any DOE research, and yet that has now become the central focus of activities. Can you tell us why that is?

Mr. BARNES. No, Mr. Chairman. Again, as we come forward with the final research plan in our report, we will be covering the DOE research in more detail.

Senator MITCHELL. Mr. Barnes, on any question that I ask you, which you cannot answer, I ask you to make a good faith effort to answer them in writing to the committee at your earliest convenience.

Mr. BARNES. I will do so.

Senator MITCHELL. If you, even after that effort, are unable to respond, notify us of that.

Mr. BARNES. I will be glad to do that, Mr. Chairman.

Senator MITCHELL. The Amendments to the Superfund also require EPA to prepare a national assessment of radon locations and amounts by October of this year. The draft radon research plan indicates that the survey will not be finished for several years. I have two questions.

First, what information will you be able to provide by October? The answer is probably evident, but why are you not able to complete the response by October?

Mr. BARNES. Mr. Chairman, the national survey is something that we have have been planning for over a year. We have it, as I explained in my statement, pretty well designed. We are about to take it to our Science Advisory Board for approval. Then it has to go through the OMB process for reviewing proposal surveys.

Then we would expect to have the canisters that we will be putting out in place for a year. We think that it is important to have not just short term results but rather to have the canisters in place for a longer period of time.

What we will have for you in October are the results of a number of those state surveys that we have been working with states on. We have tried to design them in a way that is complementary and thus expand the reach and power of the for those State surveys national survey we are doing. We will have some information that we will be able to include in the report and make available to you at that time.

Senator MITCHELL. My time is up, so we will go to Senator Lautenberg.

Senator LAUTENBERG. Thank you, Mr. Chairman.

I just wanted to clarify one thing that Senator Chafee asked about, and that is other countries. I visited Sweden a year ago this past January with representatives from the building industry, with a member of the EPA staff, Dr. Rich Guimond, and we found out,

Senator Chafee, that there has been a lot of work done there. The threat was recognized at a much earlier stage.

In fairness to EPA, the program took time to develop, but they do have building standards, they have codes. The Swedish national government insisted that municipalities pick up the cost for testing because they didn't want that argument out there going on. What they wanted to do was find out whether people were exposed and get done with it.

They forced the municipalities to pay for those studies. They are well into it, and when they talk about 100-year, or whatever number of years their plan is, that is to reduce at almost any level from radon. They are not talking about these high risk levels that we are considering now because it is believed, I think, that long-term exposure, even at levels below the four picoCuries per liter could be dangerous.

Mr. BARNES. That is correct. Senator Lautenberg, we view that the risk that you run bears a direct proportion to your exposure to radon.

Senator LAUTENBERG. I would say this, Senator Chafee, I think you asked a very good question.

I would have to ask you, Mr. Barnes, what have we done to find out? You said that you had contact with people in the U.K. What have we done to cooperate, or work with or learn from the Swedes who were the first, I think, to get into this problem. Their nation is covered with this material.

Mr. BARNES. Again, I should have Mr. Guimond speak directly to your question. I believe that over the past few years, we have developed a working relationship with people in Sweden. In fact, I believe we have a visitor here now from the Swedish program.

Senator LAUTENBERG. Mr. Guimond, I said great things about you before I saw you sitting in the room.

Mr. GUIMOND. We have been trying to work with a lot of the European countries on their knowledge on radon. It is not Sweden that we have a visitor from. We have a visitor from the Commission on European Communities who will be speaking with us today at EPA. He has been visiting and meeting up at DOE in the early part of this week.

We are trying to learn from the research that they have going on. We are trying to share our information on studies that we have, and try to short circuit some of the studies. I will give you an illustration.

I think that a lot of the work that we have done on our mitigation program, we picked up our mitigation research, was based on the studies and research done in Sweden, as well as a few other European countries.

Senator LAUTENBERG. Was your trip with me the first time anyone from EPA had been there, or had serious discussions with people in Sweden?

Mr. GUIMOND. It was not the first time that we had discussions. I think that it was the first time that we had anyone visit the various agencies in Sweden.

Senator LAUTENBERG. We have been working for about 20 years on that.

Mr. GUIMOND. Correct.

Senator LAUTENBERG. Thank you, Mr. Guimond.

Mr. Barnes, I understand that EPA requested more from OMB for radon than was actually proposed in the 1988 budget. I don't want to ask Jim Miller, I want to ask you. How much did you request from OMB?

Mr. BARNES. We asked for 64 work-years and about $7.5 million.

Senator LAUTENBERG. What do you think you might have been able to do had you gotten that additional resource?

Mr. BARNES. Essentially, that money would have gone to an accelerated research and development program with respect to the diagnosing and mitigating research in homes, and technical assistance to States in terms of working with them on State surveys and building their programs.

We have set a goal for ourselves to be in a position by the early mid-1990s where we have most of the States in this country in a position to deliver on this problem, and then the money that we put into it the program now puts us farther along to having the tools to meet that goal.

Senator LAUTENBERG. You do, I think, in careful phraseology, acknowledge that mitigation work will suffer as a result of this reduced resource?

Mr. BARNES. There certainly is a relationship between the number of people and dollars, and how many homes that one can work with.

Senator LAUTENBERG. Fewer demonstration projects, for instance.

Mr. BARNES. Yes.

Senator LAUTENBERG. How many demonstration projects will you be able to do?

Mr. BARNES. This year, we are looking to do about 110 existing homes and 25 new homes. My recollection is that the figures for next year are about 45 old homes and about 55 new homes.

Senator LAUTENBERG. It is believed that along the Reading Prong alone there might be 250,000 homes at risk.

Mr. BARNES. Mr. Chairman, we are not purporting to be able to do demonstration work in every home. What we did do working with our SAB was to set up a matrix of different housing types such as slab on grade construction, ones with basements, poured concrete blocks, and with different kinds of soils that homes might be found on—and are now trying to find homes that allow us to fill out that matrix of different home types, different soil types, so that with increased confidence, we can go to different parts of the country, go into a home and when we find that it has a problem and we will have some idea of what kind of mitigation techniques will work, given the construction of that home, the soil that it is found on, et cetera.

Senator LAUTENBERG. It would give us a better sampling of the construction and the problems that arise. It would help us, I think, deal with the problem in a more rapid fashion.

Thank you, Mr. Chairman.

Senator MITCHELL. Thank you very much, Senator Lautenberg.

Senator Chafee.

Senator CHAFEE. No, thank you, Mr. Chairman.

I want to thank Mr. Barnes for coming, and I appreciate it.

Senator MITCHELL. Mr. Barnes, thank you. Senator Durenberger was here, but he had to leave for another commitment. He may have some questions that he would like to ask, and I would ask you to respond to them.

Thank you very much, Mr. Barnes, we look forward to working with you.

The next witnesses will be a panel, State Senator Judy Kany of Waterville, Maine; Mr. A.J. Hazle, the Director of the Radiation Control Division of the Colorado Department of Health, representing the Conference of State Radiation Control Directors; and Mr. Donald A. Deieso, who is the Assistant Commissioner of the New Jersey Department of Environmental Protection.

Welcome. We look forward to hearing your testimony. I am particularly pleased to have Senator Kany here. She represents my hometown in Maine, otherwise known as the basketball capital of New England. She has served with great distinction in the State Senate. She is a leader in the area of environmental protection, with particular interest in this area.

We are very pleased to have you, Senator Kany. Why don't you begin.

STATEMENT OF HON. JUDY KANY, STATE SENATOR, STATE OF MAINE

Ms. KANY. Thank you very much.

Senator MITCHELL. I remind the witnesses, beginning with you, Senator, that we do have a five-minute rule. Your written statements will be placed in the record in their entirety. We ask you to summarize them, hit the high points, and limit your remarks to five minutes.

Ms. KANY. Senator Mitchell, Senator Lautenberg, and Senator Chafee, thank you for the opportunity.

First of all, I would like to mention that Waterville, Maine, is under a good deal of water today. We have a 500-year high flood, far exceeding the 1936 flood in Waterville, the Kennebec River having crested.

My name is Judy Kany. I am a State Senator, and chair Maine's Advisory Commission on Radioactive Waste, which advises both the Governor and the Legislature on radioactive waste management issues.

I wish to address three areas in my five minutes. They are the extent of the radon problem in Maine, what current efforts Maine is making to address radon contamination, and in what areas Federal assistance would be most helpful.

Research on the presence of radon in Maine homes is not a recent phenomenon. A bibliography attached to my written testimony traces some of the efforts we have made to understand the nature and the extent of radon contamination in soil, water and air.

Much of the early research in Maine focused on radon in groundwater. Later investigations looked at the transfer of radon from household water to household air. Research has also been undertaken on techniques designed to prevent the influx of radon from water and soil into the indoor air.

Most recently, a cooperative study by a private hospital, university and State agency personnel has and continues to investigate the potential for lung cancer risk that is associated with domestic radon exposure in Maine. Most of my comments are based on these studies or conversations with the researchers.

High levels of both water and airborne radon have been reported in Maine homes and I would like to speak first about the incidence of radon in groundwater.

Much of Maine is underlain by granite plutons and metamorphic rocks that vary in the extent they were altered by heat and pressure. The presence of uranium and radium in these rock structures and in the soil overburden has led to many high levels of radon in water and many domestic wells.

Maine has had radon levels in water from a private well as high as 1.7 million picoCuries per liter, the highest recorded level in the world. Radon air levels at this home were above 100 picoCuries per liter in living areas, and rose to more than 2,000 picoCuries per liter in the bathroom when water was used.

While most users of public water supplies are not exposed to significant levels of radon from their water, Maine has more than 100,000 households with privately-owned wells. In the majority of Maine towns, more than 20 percent of the households are served by individual drilled wells in bedrock. High radon water values, more than 20,000 picoCuries per liter, are concentrated in towns located in south-central and southern Maine regions where most Mainers live.

Recent preliminary analysis of data collected from 500 Maine homes with drilled wells showed the metamorphic grade of the bedrock was strongly associated with water radon levels. The average radon level tripled from low grade to highly altered rock, and doubled from high grade metamorphic rock to granite. The authors estimate that 10 percent of the homes in Maine with private wells have water levels above 20,000 picoCuries per liter.

A 1983 study indirectly corroborates these findings. In that study, granite rock in Maine had a mean radon level of 15,000 picoCuries per liter. The State Bureau of Health currently recommends remedial action be taken if radon water levels exceed 20,000 picoCuries per liter. It is my understanding that EPA is considering a much lower level for its standard when it finally announces what the standard is.

The risk associated with radon in water is not so much from drinking the water, although some risk of developing stomach cancer does exist, but from the transfer of radon from water to the air.

I will try to summarize some of my testimony. I will just say that, as of June 1986, the State had tested 1,500 air samples and 3,200 water samples for radon. Thirty percent of the 1,500 homes tested for airborne radon showed a reading above 4 picoCuries per liter, the amount, I believe it was Senator Lautenberg, indicated was equivalent to 200 chest X-rays.

In the past nine months, there have been more than 1,000 tests on water samples and more than 1,000 tests on air samples. The average radon level on air tests performed is: 3.9 picoCuries per liter.

I would just briefly like to discuss the areas of need, basic research, education, and demonstration programs. We need more personnel and equipment for our very small division of health engineering, which has 2.5 employees, who also deal with all other types of indoor air pollution.

Development and promotion of educational programs targeted at specific groups, realtors, well water treatment specialists, contractors, well drillers, as well as citizen groups. We need school testing badly. We have many schools with drilled wells, over areas where there is likely soil radon gas.

The establishment of a radon hotline to address concerns. We need appropriate, safe disposal of contaminated materials and contaminated well water by-products. We need a study of lung cancer to demonstrate actual risk. And we need field studies, in Maine, to find the high soil gas radon areas.

We need an accurate, inexpensive soil radon test for home sites to alert the builders when special construction methods should be used. Also, a study of the transfer of radon from water into air, to help in the formation of a meaningful radon and water standard for the U.S.

Also, a correlation of radon concentrations in groundwater, aquifer hydraulics, in uranium geochemistry, to better understand the reasons for widespread variations in radon concentrations in nearby wells.

Construction of model radon-free homes to illustrate methods for builders. Research into retrofitting of old homes is needed. Expanded research to determine actual health risk and, perhaps, low interest loans, for those people who have significant problems and cannot afford to treat them.

In conclusion, the basic and applied research needs to be done. The people need to be educated more about radon and what can be done about it, and demonstration projects would be extremely helpful.

Unlike so many of the public health programs your subcommittees address, a relatively small investment can make a huge difference. We have a known health risk. A problem that can be anticipated and controlled. High radon levels in a confined area can be remedied, and it is important that Maine citizens and all citizens of this country learn that radon is a remediable problem.

Therefore, we Mainers, who are familiar with the radon problem in Maine, and there are mighty few of us I might add, are strongly supportive of the effort and thrust of Senator Mitchell's and Senator Chafee's legislation; both the State Radon Development Act and the Radon Detection in School Buildings Act.

Senator MITCHELL. Thank you very much.

Before hearing from the next witness, I would like to recognize Senator Pressler.

Senator, do you have a statement you would like to make?

OPENING STATEMENT OF HON. LARRY PRESSLER, U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Senator PRESSLER. Mr. Chairman, thank you very much. I do have a statement I will put it in the record. I shall not read it. I compliment the witnesses, and you, Mr. Chairman.

In my State of South Dakota, we are testing over 500 homes, and found that over 30 percent have radon gases in excess of the EPA recommended levels. That is a very serious problem in the State of South Dakota, as it is in other States, and I commend the witnesses that we are hearing today.

[Senator Pressler's statement follows:]

OPENING STATEMENT OF HON. LARRY PRESSLER, U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Mr. Chairman, I commend you for scheduling these hearing on the health threat posed by radon gas. This is a problem which may affect a substantial portion of the population of the United States and it is critical that this committee carefully examine it.

Radon is an odorless radioactive gas that occurs naturally in many areas of the country. The Environmental Protection Agency has estimated that one of every eight homes in the United States has radon levels that exceed recommended standards. In my home state of South Dakota, a testing of over 500 homes found that over 30 percent have radon gases in excess of the EPA recommended levels. Radon is a decay product of uranium which occurs in the ground and seeps into dwellings through cracks and other avenues. Experts have estimated that radon gases in homes and workplaces have become the second greatest cause of lung cancer in the United States, causing between 5,000 and 20,000 lung cancer fatalities annually. The frightening thing about radon is that most homeowners or office workers are unaware of its presence. The average homowners very likely does not know what radon gases are, its impact on human health, and certainly not the presence of such gases in his or her home.

It is important that the EPA and this committee as well as state and local governments work to educate homeowners about radon and what actions they can take to reduce radon gases in their homes. The EPA has implemented a program in an effort to address this problem. The committee needs to examine that program and the efforts of other agencies. Are these programs adequate? What further actions are necessary? These are some of the questions we should ask.

I look forward to hearing from our witnesses.

Senator MITCHELL. Thank you very much, Senator.

We will now hear from, Mr. Hazle.

Mr. Hazle, you are representing the Conference of State Radiation Control Directors. We welcome you, and look forward to your testimony.

STATEMENT OF ALBERT J. HAZLE, DIRECTOR, RADIATION CONTROL DIVISION, COLORADO DEPARTMENT OF HEALTH, REPRESENTING THE CONFERENCE OF STATE RADIATION CONTROL DIRECTORS

Mr. HAZLE. Mr. Chairman and members of the subcommittee, I am Albert J. Hazle. I am Director of the Radiation Control Program for the Colorado Department of Health.

My personal experiences bridge the experience of the uranium miners to uranium mill tailings and, now, to radon exposure of the general public.

I am speaking today on behalf of the Conference of Radiation Control Program Directors, and the State of Colorado. Both the Conference and the State sincerely appreciate the opportunity of

providing testimony on Senate bill 744 and support it very strongly.

While there is a considerable effort being mounted by States, with regard to radon and its associated hazards, many States have not been able to make adequate resources available to do even a minimal effort, with the exception of responding to telephones calls from the general public.

Several States have been able to address the matter in a more substantive way, but none have been able to address the matter to the level that it should be. In point of fact, most States are attempting to address the radon problem by taking resources from other necessary programs, thereby creating other problems.

Ten States, including Colorado, are receiving the services of the EPA by the provision of charcoal canisters for surveying of various geologic, demographic, and political areas of the respective States. No monetary support is being provided by EPA. The provision of the 3,000 canisters to each such State, does not allow proper statistical analysis of the various locales involved.

Add to this the economic concerns for realtors and others, who recognize that the screening sample procedures, maximize results. As a result, this places an economic penalty on persons and locales participating.

The provision of a national survey based on annual average radon concentrations, which are directly comparable to the EPA guidance, would be in order.

With regard to section 4(a)(7), the Conference respectfully requests such a national survey, and that the State programs be the prime focus of the generation of such annual average radon concentration information.

With regard to section 4(a)(1), the Conference suggests that the Conference's Bulletin Board computer network be used in the efficacious dissemination of such information to the State programs.

With regard to section 4(a)(4), we suggest that information be developed with the input of the Conference and others, in an effort to much such information fully usable by the public.

We also suggest, in section 4(a)(b), line three, that the word "may" be changed to "shall" requiring Federal government assistance to provide that requested assistance.

The Conference is fully supportive of section 5 of the bill as proposed, recognizing the limitations specified therein. From our reading of the bill the provision of radon measurement devices could be provided within the 10 percent limitation relative to Section 5(c)(4) and Section 5(j).

With regard to Colorado, while most of the radon screening measurements are below EPA guidance, we have identified maximum levels of 785 and 432 picoCuries of radon per liter air, and 200,000 picoCuries of radon per liter of water.

Attached to this testimony is the State of Colorado's Indoor Radon Policy Task Force Work Plan. A number of other States have also developed work plans. Additionally, we have included a copy of a general letter, responding to people's inquiries regarding the Colorado situation.

Real estate transactions based upon EPA's screening measurement protocol and EPA's action guidance, cause a significant

number of sales to fail, particularly during the winter heating months.

In Colorado along the front range, between 30 to 40 percent of all such measurements exceed the EPA's action guidance level of 4 picoCuries per liter of air. In Boulder County, the failure rate approaches 70 percent. In a county in Alabama, 50 percent of the locations sampled exceeded EPA guidance value. The vast majority of the identified values in excess of EPA's guidance are below 20 picoCuries per liter of air.

A proper protocol must be developed by EPA for use by the real estate industry, to preclude unnecessary concern by the occupant, seller, buyer, realtor, lender, and relocation industries. The impact is significant enough, if the EPA's national estimate of 10 to 12 percent of all single family residences is in excess of that guidance.

Another concern of Colorado and a number of other States, is the confidentiality of private property data in the possession of Federal, State and local government, when there is a need for those entities to have data by specific location, for the purpose of identifying problem areas requiring special techniques of construction.

The Conference and Colorado are very supportive of this bill, and also Senate Bill 743, the Radon Detection in School Buildings Act. Again, the Conference and the State of Colorado appreciate the opportunity to testify before the subcommittee. Thank you very much.

Senator MITCHELL. Thank you, Mr. Hazle.

Before you testify, Mr. Deieso, I want to apologize to you and the subsequent witnesses, I have to attend another committee meeting. I am a member of the Senate Select Committee on Iran and the Contra Affair, and that committee is beginning an important meeting right now and I have to go to that.

Senator Lautenberg, who is cochairman of this hearing, will introduce Mr. Deieso, since he is from New Jersey, and will take over the hearing. I will review your statement and that of other witnesses, and will look forward to working with you.

Thank you.

Senator LAUTENBERG [presiding]. Thank you very much, Senator Mitchell.

Before you leave, I want to be sure, Mr. Hazle, you left out a paragraph from your oral statement that is in your written statement. It is the one that begins: "It should be recognized by sponsors of the bill." Do you want to read that, or did you leave it out accidentally?

Mr. HAZLE. In in the interest of time, I left it out, to meet the five-minute deadline.

Senator LAUTENBERG. It is a very provocative paragraph, and I would appreciate it, if you don't mind, I would like to hear from Mr. Hazle on that.

Senator MITCHELL. You are going to question him on that?

Senator LAUTENBERG. Yes.

Mr. HAZLE. It should be recognized by the sponsors of the bill that there are individuals and entities that feel that EPA and the Centers for Disease Control have over-estimated the risks associated with environmental levels of radon. Those of us in the radiation protection and control have a concern that if such an over-estima-

tion does indeed exist, it could lead to a radiation program credibility problem in the future.

Senator LAUTENBERG. I just wanted to have that clear, and we will talk about it in a minute, after Mr. Deieso's testimony.

I indicated earlier that Don Deieso comes from my favorite State. He is an Assistant Commissioner for the New Jersey Department of Environmental Protection. We welcome him as well as the other panelists. Each of you represents a State that is precious in the structure of our country, that are beautiful States, and States that, on the surface, you couldn't imagine would have any harmful materials naturally developing there.

It kind of talks to the universality of the problem in particular. However, in New Jersey, where we have an abundance of many things, including very creative people, relatively high income, and so forth, we have an abundance of toxic waste sites because our State is highly industrialized. We also have a fairly significant spread of radon gas that could affect, as I am sure you will hear from Dr. Deieso's testimony an awful lot of homes, perhaps as many as a quarter, I think.

Dr. Deieso, I look forward to your testimony and I invite you to proceed.

STATEMENT OF DONALD A. DEIESO, ASSISTANT COMMISSIONER, NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

Dr. DEIESO. Thank you, sir.

Senator Lautenberg, good morning to you. I am particularly gratified to appear before you today since it was over one-and-a-half years ago that we joined you in preaching the radon gospel in our State. It is even more encouraging to see that your vigor on this issue continues. We thank you.

You have asked us to describe today the severity of the radon problem in New Jersey. Let me very simply say, it is the most significant environmental exposure known to us at this time. It dwarfs the human exposures associated with air pollution, drinking water contamination, or hazardous waste.

Today, in our State, and in national average, out of every 100 of our residents, 20 will develop some form of cancer during their lifetime. Of these 20 cancers, five will be lung cancers. Of these five lung cancers, two to three are now attributed to smoking, the remaining two to three cases are attributed to other factors, of which radon exposure may very well be the predominant cause.

Through radon programs, then, we have an opportunity to reduce the incidence of lung cancer by one-half. You have heard EPA national estimates of 5,000 to 20,000 lung cancer deaths each year attributable to radon. Senator, the stakes are very high and very real.

Senator, we have over two-thirds of our States potentially affected. This translates to over two million homes and five million residents. Of the 10,000 homes tested for radon to date in our State, 28 percent exceeded the four picoCuries per liter level, almost one in three homes or 600,000 of our homes, it is fair to assume, will require some form of radon remediation.

We have measured over 100 homes in our State with levels exceeding 200 picoCuries per liter. This translates to a lung cancer death risk of 70 percent, seven in ten odds that are quite formidable.

Last year, we identified Clinton, New Jersey, as our first radon cluster, a cluster of 120 homes, all exceeding four picoCuries per liter. In fact, levels from 200 picoCuries per liter to 2,400 picoCuries per liter were measured in this quiet town.

The Clinton cluster is now well on its way to being solved, with remedial actions completed on many of affected homes. The measures have reduced the radon levels by 98 percent at an average cost per home of $1,500. What emerges from these facts can be summarized in three statements.

First, radon exposures represent today the environmental exposures of greatest consequence.

Second, our estimates confirmed by field measurements in over 10,000 houses indicate that over two million homes are potentially affected with 30 percent of these likely to exhibit levels above four picoCuries. This issue is very real.

Third, radon can be corrected and corrected at a very modest cost.

Let me say a few words about the radon actions underway in our State.

First, in January of 1986, Governor Thomas Kean enacted radon legislation which, along with other important provisions, appropriated $4.2 million to the Department of Environmental Protection, and our Department of Health for radon activities. I must add, parenthetically, this amount rivals or exceeds the entire national EPA radon budget.

With this appropriation, and statutory authorities, we have initiated some very effective measures.

First, a $1.3 million statewide study intended to pinpoint those areas of the state at highest risk.

Secondly, an epidemiologic study. Going into the tumor registries, we have selected 800 of those cases in our State of lung cancer. We will measure radon in those homes, and for the first time have a national set, or at least a statewide large-scale set of epidemiologic data on the connection of radon and lung cancer.

Thirdly, we have established a toll free radon hotline that is staffed by radiation physicists, and to date we have fielded over 30,000 phone calls from interested residents.

We have certified testing and remediation firms. We started a year-and-a-half ago with only one or two firms in the State capable of doing radon tests. Today, we have certified 50 such firms with another 36 asking for that certification. We offer confirmatory testing to our residents. If they receive a result from a certified tester in excess of four picoCuries, we will come into that home at no charge and give a second opinion of that result.

We have a radon remediation low interest loan program sponsored through our home improvement loan efforts, sponsored in part by HUD. We can now offer a radon home remediation loan to an affected homeowner. This loan, up to $15,000, can be received within one or two weeks of application, and with a repayment period of ten years.

This brings me to what we consider to be the number one obstacle that lies between us and a very effective radon program in our State. Public apathy—public apathy.

Despite our public education and information efforts, only a small fraction of our residents have had their homes tested. Public opinion polls, we have sponsored, reveal that the reasons for apathy are not financial. The costs of testing are reasonable, $12.00 to $25.00. Remediation costs are reasonable, rarely exceeding $1,000. In fact, the remediation costs represent less than one percent of the house value. Yet, apathy continues.

The ideal formula for getting our residents inspired to action has yet to be discovered, but the bills in consideration here today certainly will be part of that solution.

I see my time has expired. Let me say one word on EPA.

We find that EPA's focus on radon is well placed. The efforts that they have placed have been invaluable to us. The Clinton success story would not have been a success, or could not have been written without EPA. We need more of this support. We need more EPA resources dedicated to the States in each of those areas.

Thank you.

Senator LAUTENBERG. Thank you very much, Dr. Deieso.

The signal that you just heard suggests that a vote is taking place. I would prefer, if you can endure, to take a 5-minute recess so that we have some continuity in the questions. We will take a five or six-minute recess.

[Recess.]

Senator LAUTENBERG. We are going to resume the hearing, and I would ask the witnesses to please take their seats. I am appreciative again of your indulgence while we went to vote.

Senator Chafee, we have just heard from these people representing the problem of radon in three States. We haven't have any questions asked yet. I have a few.

Senator CHAFEE. Mr. Chairman, I do not have any questions, so any time I have, you go ahead and take.

Senator LAUTENBERG. Thank you very much.

A couple of the things that came out in the testimony that are of some significant concern. We do see a difference in view on the danger that exists. At least, we had a question raised about it, and we will get into that.

I would like to get to something that Dr. Deieso talked about. You used the term "apathy," which I think describes the general condition out there.

One of the most difficult problems is convincing the public of the serious health threats that come as a result of this odorless, tasteless, invisible material. Look what it took to get people persuaded that cigarette smoking was dangerous, and they knew they were doing it and could see it. Imagine how difficult a message it is to get through when you can't see it, taste it, et cetera.

Do you think that public awareness is building. Can we ever capture the attention of the American public without a major campaign akin to the tobacco campaign, or the anti-smoking campaign, or something of that nature? What do you think?

Ms. KANY. If I may, Senator Lautenberg, I would like to respond to that, because your representative from New Jersey, in my opin-

ion, was absolutely right on target, talking about the public apathy. We are having a terrible time in Maine trying to convince people that there is the public health risk, and that they can do something about it cheaply and easily.

I think that what we are going to have to do is to ignore some of the real estate interests who want us to be very quiet about this, and to identify specific areas in communities in which it is very likely that you do have very high radon levels.

I suggest putting up a map with points on it. I believe that this is the only way that people are going to take it seriously. Perhaps you have done that in New Jersey. We have not named affected towns. We may have named granite bodies, but not towns.

It reminds me of a year-and-a-half ago in Maine. I remember mentioning then that we were one of 17 States in the East that were under consideration for a high level nuclear waste repository. People just laughed. They thought I was just kidding. It was highly unlikely that Maine would be one of the semi-finalists for the second repository. This is the same situation. They simply think it is off-the-wall if you suggest that there is a real health problem and that it should be addressed.

Mr. HAZLE. Mr. Chairman, EPA, a group other than the Office of Radiation Programs, does have an effort to look into the public apathy in this particular area. They have requests for proposals out to States and research institutions to address this very problem.

Senator LAUTENBERG. Obviously, it is going to take some significant money. We think of the national health matters that have come about in these last years—cigarette smoking, cholesterol, et cetera. We have Cholesterol Week. Maybe we need a Radon Week, or something like that. We certainly do have to alert people to the fact that this is a serious risk. Because it takes such a long time, it makes it an even more difficult problem.

Have you found that people, whose incomes are in the lower tier, are unable to deal with the mitigation?

Dr. DEIESO. Senator, what we see are three or four possible explanations. I don't agree that any single explanatory is predominant.

It has been suggested that our residents are desensitized to environmental issues, a result of the carcinogen of the week syndrome. They read every day that there is an exposure to chemical x in their diet, or chemical y in their air. This has taken its toll to the point where radon has become just another of a never ending litany of chemicals.

The second is that radon, unlike other contaminants, has no villain. It doesn't have a specific chemical company or a resource recovery facility, or a planned hazardous waste incinerator as its source. Nature is the source and it affects someone's home.

The third, and I think the feature that is probably most important, is that it is intimately tied to real estate value. When we look at the 30,000 calls we received on our hot line, 50 to 75 percent were not public health oriented calls. They were folks asking questions like what can I do? Can I sell my house, and is my property value going to suffer? Real estate concerns predominate. This has been confirmed by an Eagleton Poll that we sponsored back several months ago.

We find that even when our residents were asked the question: If you corrected your high radon home and brought it to acceptable levels, do you perceive that your property value would suffer? Fifty percent of them said: Yes. Even with the radon corrected, we will lose property value. That is a very serious fact, and that is something that we have to work on and change. Radon remediation should be considered by homeowners as they do termites, something that can be corrected. It will need vigilance, but it can be addressed.

Senator LAUTENBERG. Eventually, I think that we are going to see it as part of any real estate contract. There is going to have to be a certification by the seller that says: To the maximum extent possible, including the following tests, we declare this home has a level below *x* of radon per liter. That is what is going to eventually happen, but it is going to take a long time.

Senator CHAFEE. Mr. Chairman, due to a prior commitment, I have to leave. I have a series of questions to ask the next panel, which regrettably, I can't be here for. I wonder if it would be possible for you to ask those questions for me? If you would do that, I would greatly appreciate it, rather than my writing them, because getting the answers back sometimes is a problem for both sides.

Senator LAUTENBERG. We will be happy to do that. I am sorry, Senator Chafee, that you have to leave. I understand you have a meeting at a fairly high level, which I would like to keep you from.

Senator CHAFEE. Thank you very much.

Ms. KANY. Senator Lautenberg, I would like to respond to that question also. We have in Maine approximately 300,000 separate residential dwellings out of 420,000 households in the State, yet only 3,200 have had radon testing of their water, and only 1,500 of the air. In fact, we only started testing for air radon just last year. What a small percentage of our population have had their dwelling tested cutting across all income levels.

Our per capita income level is very low in Maine, extremely low. We have a great deal of poverty in the State unquestionably. The $20 or so probably discourages many people from having their dwelling tested. Even a $50 remedial effort would be of great cost to many of our impoverished citizens.

Senator LAUTENBERG. That is very interesting. New Jersey is doing very well these days, and we have the third highest per capita income in the country. The focus, as you see, is on the real estate values, more than the health concerns, because it is too far removed. Real estate values are an immediate thing.

Certainly when you look at the budget, we have to consider all aspects of what it takes to deal with this problem, not the least of which is to send up the red alert that says: Hey, your house is on fire, and you have got to do something about this. It is an awfully tough message to get through.

I was sitting with a prominent builder in New Jersey, and his wife. We met by accident in a restaurant. The builder said to me, "That radon stuff, we live in that area, and we don't worry about that." This was not someone who was unsophisticated, without access to information. It didn't mean a thing to him.

I told him that I thought it was pretty serious, that I had had my home tested. Unfortunately, we found a high level of radon concen-

tration in the groundwater that had gathered in the corner of the basement sump pump. We have to continue to work on that.

Senator Kany, you have introduced legislation concerning radon testing of homes at the time of sale. What has been the reaction to that bill?

Ms. KANY. Thank you for asking, Senator. I was shocked at the lack of interest in that hearing compared to other issues that I am involved in now. There were four people who testified. One person from our Bureau of Health testified in favor, a cosponsor and myself, one person testifying in opposition, and that was it. The opposition was from the Maine Association of Realtors.

None of our environmental organizations were even involved. They are focusing on solid waste and nuclear waste currently. The level of understanding of the seriousness of this issue simply is not there.

Senator LAUTENBERG. That is too bad. Again, we just have to continue to press.

I have found the real estate industry to be very cooperative in our State. Homebuilders are trying to design homes that anticipate the problem, do the testing, design homes that give assurance to the owner or the occupant that they are not going to have any problems. They have decided that it is part of life, and you had better adjust to it. That is the way I would hope we could get the industry across the country to view it.

Mr. Hazle, based on your discussion with other State officials involved in that Conference of State Radiation Control Program Directors, how many States do you expect would be interested in these grant assistance programs to respond to radon problems?

Mr. HAZLE. I believe that probably the vast majority would have definitely some interest, and some of it very major. I know that in the case of Montana, they recently found, in the Helena Valley locale, that may involve 2,000 properties that ran, with the screening measurements, 60 picoCuries per liter. When these things are identified, there is a great deal of interest and a great deal of need to move.

Senator LAUTENBERG. Dr. Deieso talked about the risk to health from exposure to radon. I, obviously, was struck by the question you raised about whether or not the threat is overestimated.

Dr. Deieso, would you just recall for us what you described as the risk and about the ability to reduce that risk. Let's talk about the risk itself. What did you say that you thought the risk was for lung cancer disease from radon?

Dr. DEIESO. Senator, we have, out of every 100 residents in New Jersey—New Jersey statistics match the national picture coincidentally, but if we look at New Jersey statistics, 100 of our residents, out of every 100 residents, 20 will develop some form of cancer in their lifetime. Of those 20 cancers, five of them will be lung cancer. Of the five, we believe two to three are attributable to smoking, and the remaining two to three lung cancers are associated with other factors. It is reasonable now to believe that perhaps those other two to three may, in large part, be influenced by radon exposures.

If we look at it through those eyes, we have an opportunity in radon control to one-half the number of lung cancers that we have in our country, and certainly in our State.

Senator LAUTENBERG. Mr. Hazle, your statement suggests that at least an overestimate is likely. Do you want to clarify that? Why is there such a difference in view?

We have the CDC saying that six million people are exposed to dangerously high levels of radon gas. We heard Dr. Deieso's comment, and we have seen it in other places. I think there was a question raised earlier by Senator Mitchell.

Mr. HAZLE. First of all, it was a minor comment, and it was only to point out that there is some difference of opinion as to where the level or cut-off of action is appropriate, whether it is four, whether it is ten, whether it is 20, whether it is one-and-a-half.

Point in fact, I have been through EPA's calculation personally myself, and I do not disagree with them. They are well within the range of the error associated with such determinations.

In Colorado, one out of five people die of cancer, one out of four of those, or one out of 20, die of lung cancer. The estimate that EPA has said, 10 percent of lung cancers is due to radon. This says that 90 people in Colorado per year die of radon. I don't disagree with those kinds of numbers.

However, if you look at EPA's Citizens Guide for Radon, under the assumptions used, 70-year exposure, 75 percent occupancy at four picoCuries per liter, three out of 100 are supposedly to die of radon, that equates to 30 per 100,000, and that is the death rate from lung cancer in Colorado from all causes.

The basic substance, the basic fact is that EPA's guidance is pretty good, but what happens is that the perception generally nails us to the wall, not necessarily the fact. If people don't see the dead bodies down the road, and we come back with radiation programs that request assistance in another area, and they say: Gee, you didn't hit the nail on the head before. We are going to have a tough time getting support in other areas. That is the only concern.

Senator LAUTENBERG. You do agree, though, that exposure to high levels of radon gas is dangerous?

Mr. HAZLE. Absolutely, sir. I have dealt with the uranium miners. I can give you all kinds of widows.

Senator LAUTENBERG. As a matter of fact, wasn't it in 1973, in Colorado, that the discovery was made that radon gas within the homes, and within buildings, could be a dangerous condition.

Dr. Deieso, you said that as many as two million homes in New Jersey could be affected?

Dr. DEIESO. That is correct, Senator.

Senator LAUTENBERG. How many of those homes have been tested?

Dr. DEIESO. Ten thousand, a fraction, of course, of what it should be, and a fraction of a percent.

Senator LAUTENBERG. New Jersey has allocated more to radon research, testing, and mitigation than the Federal Government realistically.

Dr. DEIESO. For the past fiscal year, that is what our accounting would show.

Senator LAUTENBERG. With all of that, the awareness level is not where it ought to be. That is certainly suggested by the fact that there are only 10,000 homes tested. For most people, the $10.00 to $25.00 for testing is not significant, and it only highlights how significant this problem is for us. It is primarily an education process.

Dr. DEIESO. We think so. In fact, Senator, to carry one of your points further, if we look at only the cost of remediating a home, and let's take an average of $1,200 per home. A real estate attorney, who shared this perspective with me last year, said: Oh hell, I receive more than that in closing fees. The homeowner will pay two and three times that in points to a bank for that mortgage and financing.

Let's put that remedial cost in focus. It represents a very small piece of the property value, and the house value, Other costs that a homeowner accepts routinely in the real estate transaction, they simply don't take exception with. To look at the remediation costs in any other light does a disservice to the issue.

Senator LAUTENBERG. The fact is, though, that 1 percent to someone who owns a house worth $30,000 more often, a $300 bill would be more taxing than for someone who owned a $200,000 house who had to spend $2,000. We have to do whatever we can to encourage people to do it. The grants program that is suggested in this legislation, I am sure, all three of you approve of.

I have another bill that has now been introduced, that has been sent over to Finance to consider, and that is to make radon mitigation expenses tax deductible like any other health assistance, whether it is appliances for a handicapped person, or even, in some cases, as outrageous as it sounds, a swimming pool to help someone with a back problem. They have been known to be eligible for deduction.

I think, certainly, if we want to say that States ought to participate in some way, what more direct participation could there be than to have residents within those States paying the cost, and getting only a small part of the money back. It is still not a full recompense for the money you have laid out.

We have other questions that we will submit to you. I wanted to close with one thing, and then we will invite the next panel up. I have to go vote again, and the time gets more precious.

Dr. Deieso, I want to ask you one question. EPA has been involved in the New Jersey radon problem for some time. How do you assess the interaction between DEP and EPA?

Dr. DEIESO. Senator, in the case of radon, the EPA has been simply outstanding. We could not have accomplished what we did in Clinton without them. This is not by accident, it stems from the fact that a year-and-a-half or so ago, they invited the States in, and they asked: How can we help you, in what areas and what should our focus be?

We offered them our comments. We advised that we would rely on them for a public information campaign. They produced a series of brochures, and they have another generation of those brochures about to be issued. R&D work, which is a vital component of radon control, can only be properly done by the Federal government.

While we would support a radon budget increase, and we mourn the fact that it has been cut in this fiscal year, EPA's R&D accom-

plishments we applaud. We wouldn't look to expanding EPA's role further, but we would look to getting a lot more money in those categories. They have been a tremendous help to us.

Senator LAUTENBERG. You wouldn't look to expand their role, but you would look to expand their budget.

Dr. DEIESO. Yes, Senator.

Senator LAUTENBERG. Thank you, all three of you for your excellent testimony.

The hearing is going to recess for just a few minutes, and then we will call the next panel.

[Recess.]

Senator LAUTENBERG. I would invite the next panel to come up, please, that would include Dr. William Leary, and Mr. Kenneth Melley. My apologies, please, for the moments taken out to try and resolve a relatively major matter in the eyes of the public and the Congress, the Highway bill.

We are nevertheless very interested in your comments. We would ask you to summarize, as you have heard the rules, however, we will be looking at the full transcript.

STATEMENT OF KENNETH F. MELLEY, DIRECTOR OF GOVERNMENT RELATIONS, NATIONAL EDUCATION ASSOCIATION

Mr. MELLEY. I am Kenneth Melley, Director of Government Relations for the National Education Association. I am here today to testify for the NEA, as well as the National Parents and Teachers Association.

We have heard a great deal in recent months about the hazards of radon in private homes throughout the United States. To date, there has been little attention given to the potentially devastating threat of radon hazards in our nation's schools.

Given recent revelations of high levels of radon gas in private homes, there is every reason to believe that radon is present in many school buildings. NEA appreciates the leadership of the Members of these Subcommittees to provide Federal assistance and guidance to conduct the needed survey of radon levels in the schools, to provide models for reducing radon contamination.

There is no question that radon is a hazard. Radon is responsible, as we have heard today, for between 10,000 and 30,000 cases of cancer each year. Only cigarette smoking causes more. It is unfortunate that the school districts do not have the information and the resources necessary to investigate these problems.

Students who spend six to nine hours a day in school buildings containing high levels of radon gas are exposed to serious, silent and deadly threats. It is believed that because they are youngsters, their metabolism is working extremely actively, and that they may be more susceptible to the effects of radon gas. The adults who work in those school facilities are at risk as well.

School buildings built in the same areas, and using similar construction techniques as private homes, where high levels of radon have been discovered, are likely to have similar health hazards, particularly one-floor schools, or school with basement facilities that are frequently used by students. They should be tested.

School buildings that have not been renovated in many years and which may have cracks in the foundation or other potential entry points for radon gas, and school buildings that have been renovated to maximize energy efficiency should both be tested for this gas.

To date there have been few systematic inspections of public schools for the presence of radon. One exception is in Pennsylvania, where a survey of 140 schools in a high risk area, including the Reading Prong (I am sure we will hear more about that), uncovered 39 buildings with elevated radon levels.

There is clearly a need for these inspections. Yet it is our belief that the EPA has done nothing whatsoever to provide direction or assistance for radon inspections in schools.

NEA strongly supports the Radon Detection in School Buildings Act, S. 743, introduced by Senator Chafee and others, and S. 744 introduced by Chairman Mitchell.

The Radon Detection in School Buildings Act would authorize the EPA to conduct a statistical survey for the purposes of determining the extent of radon contamination in the nation's school buildings. It would authorize funds to conduct tests in a large sample of the nation's schools, and to test and perfect methods of ridding schools of radon.

Providing recommendations to school districts to address the health threat of high concentrations of radon is a critical component of this legislation.

NEA also supports the State Radon Program Development Act which would direct EPA to expand technical assistance to States on radon issues, and provide financial resources to help States initiate radon related programs.

Exposure to radon gas is clearly a national problem requiring national solutions. These measures help gather and disseminate the type of information needed to make sound decisions as to what those solutions should be.

Congress must ensure that stringent standards for protecting building occupants are established at the outset. Radon testing must be performed by certified contractors according to prescribed procedures. Once the extent of the radon contamination is determined, Congress must be prepared to move quickly to mandate that school districts take appropriate action to reduce the threat of radon exposure.

It is not enough to simply be aware of the danger. We must take immediate steps to diminish the danger. Fortunately, many States lack the resources for radon inspection. We urge Congress to provide those resources to protect our children in the States and localities that clearly nave a need.

Mr. Chairman, in conclusion, the NEA is committed to the principle that our children are our future. It is essential that our children be educated to meet the challenge of that future. But it is imperative that we protect the health of those kids so that they may live to meet the challenges for tomorrow.

Thank you very much.

Senator LAUTENBERG. Thank you, Mr. Melley.

Dr. Leary, you are the Superintendent of Schools for the East Penn School District. We invite you to present your testimony.

STATEMENT OF DR. WILLIAM LEARY, SUPERINTENDENT, EAST PENN SCHOOL DISTRICT, REPRESENTING THE AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS

Dr. LEARY. Mr. Chairman, I am Bill Leary. I am the Superintendent of Schools in the East Penn School District which is in Emmaus, Pennsylvania, five miles southwest of Allentown, Pennsylvania. I am pleased to be here today to testify on behalf of the American Association of School Administrators, an organization representing some 17,000 chief school executives in public school systems in America.

We would ask respectfully that the AASA testimony presented here today be entered into the record of the committee.

I would like to commend Senator Chafee for his leadership in developing this legislative proposal, which seeks to identify whether or not there is a significant radon problem in the schools of our country. I would additionally like to commend Senators Heinz and Specter of Pennsylvania for their cosponsorship of the bill.

You have already heard the descriptions of radon and what it is, that it is odorless, colorless, tasteless, that it exists in the natural environment, that it is considered to be relatively harmless out in the open air, but in contained spaces, such as public schools and public school buildings, it can be lethal to the occupants of the building.

The Pennsylvania Department of Health has estimated that the risk of dying from lung cancer is 5 percent for each one-tenth working level, that is 20 picoCuries per liter, of lifetime exposure to radon gas. I am making the point that we are talking about lifetime exposure. This approximates the risk of lung cancer associated with smoking one pack of cigarettes per day throughout a lifetime.

In a radon survey sample of 2,578 homes in our area of Pennsylvania, the Reading Prong, it was reported that 293 or 11.3 percent, had working levels of radon, above that 20 picoCuries per liter level; 44 percent of them, 1,114 structures, were found to have working levels of radon higher than the Environmental Protection Agency's 0.02 standard cut off level. A later survey of 19,137 homes tested by DER showed that 59 percent of them had radon levels above the four picoCuries per liter level.

All of this concern has elicited additional testing of buildings, schools and homes alike, in 35 of Pennsylvania's 67 counties, 32 of those are in the eastern part of the State. Our school district, East Penn, is outside Allentown, Pennsylvania, in what is known as the Reading Prong, that runs through Lancaster, Berks, up through Lehigh, Northampton County, into New Jersey and on into the New England States.

Pennsylvania is the only State that we know that has collected data specifically on radon in schools, and I would like to share with you briefly some of those results.

The radon monitoring program in Pennsylvania has tested every public school building, that is 128 buildings in 18 separate districts in the Reading Prong area. It has also tested 12 non-public schools which voluntarily submitted to that testing.

Of those tested, 83 were found to have to contain radon levels below the Federal guideline, 43 were found to have level equal to or exceeding the four picoCuries per liter level. Twenty-four of those that exceeded received supplemental diagnostic testing. Importantly, the cost of proposed remediation ranged from a high of $43,000 to a low of $2,000, with the average cost estimated to be $19,000.

In the early part of October, 1985, six superintendents from school districts in our area were summoned to a meeting in Harrisburg with officials of the Pennsylvania Department of Education, DER, and the Department of Health. We were informed that 12 schools, containing a total of 120 rooms, were found to have working levels above the 0.02 working level found to be acceptable. The range was from 0.021 to 0.46, which is 23 times the four picoCuries per liter level considered to be acceptable.

I, as the superintendent, had received a report from DER in September of 1985 that summarized testing done in the previous May on 12 buildings in our East Penn School District. Eleven of those were found to be below the 0.02 level. One, a small elementary school, with six rooms and 165 pupils, had working levels ranging from 0.07 to 0.217, or ten times the acceptable level.

We were advised that a mitigation action of some sort, according to DER, would be required within a three-week to a three-month period of time. We were promised seed money of $1,500 per district to retain the services of a radon assessment firm.

Following that, we received from that firm an estimate of $6,305 to prepare a set of drawings, specifications, bidding documents, and project supervision for the mitigation work. We had three estimates of the cost to do the work on that elementary school, one of about $4,600, one of $14,000, and one at $35,000.

There were three levels of action that could have taken place. We chose the middle level at the suggestion of the consultant, Arix, Incorporated. When the bids finally came in, the cost estimated at $14,000 actually turned out to be $28,371. What we had at the end, when the mitigation project was completed, was $34,676 worth of unbudgeted expense to the school district.

Let me make a couple of the points for AASA, if I may.

Senator LAUTENBERG. I would ask you this, Dr. Leary, if I could. We, legally, are not supposed to be in this room past noon time. Therefore, I would ask if we can take your full text, put it in the record, as if you read it, and get on with a couple of questions that we have.

Dr. LEARY. That is fine.

Senator LAUTENBERG. Thank you very much. I am sorry to push you like this. I know that you took time to come here. I promise you that whatever information you want to provide, and have provided, will be considered very seriously.

I have a question for either or both of you. EPA suggests that action be taken to reduce radon measurements exceeding four picoCuries per liter, but there is evidence, and both of you, I think, certainly Mr. Melley, that children are more susceptible to radon, because of the high respiration rate, to exposure in the home or school perhaps.

Do you believe that EPA ought to use the same standard for radon in schools that is used in the homes. Do you have any reason to believe that there ought to be a more stringent standard?

Dr. LEARY. I really have to trust in the evaluation of the scientists and the people who set those levels. I have never had a really great explanation or a satisfactory explanation of the 0.02 working level being the so-called acceptable standard.

I do subscribe to the fact that children are more susceptible, and especially that we, in the schools, have a higher obligation, because we have compulsory attendance laws, and we have the children in our schools by design.

Senator LAUTENBERG. Mr. Melley, do you have any comment on that?

Mr. MELLEY. I don't have the technical background to respond directly to your question, but I can make reference, I believe there is some historical perspective, to an analysis done in the asbestos study that showed that children were more susceptible to the asbestos hazards than were adults.

Senator LAUTENBERG. I wonder if Mr. Hazle is still in the audience, he is the gentleman from Colorado, whose testimony was of great interest before.

Do you have a comment that you would like to offer on that, whether or not that level of exposure is the appropriate standard for public schools, the same one that we are using?

Mr. HAZLE. Senator, I have been through EPA's calculation on the four picoCuries per liter. If you are at a level, for an entire lifetime, the first 10 years of life give you a third of the total risk. From that standpoint, accepting the four picoCuries per liter, I think would be appropriate because it is calculated into the total risk.

Again, the child, in the first 10 years of life, acquires a third of the total lifetime risk at a constant level.

Senator LAUTENBERG. As far as you are concerned, that standard is an appropriate one, or at least ought to be retained as a minimum one even though there could be some debate about how serious the exposure is, as the child moves through the school, the corridors, et cetera. We ought to make certain to maintain that level.

I would ask one question on behalf of Senator Chafee. How did parents react to the news of radon in schools? Did they have an understanding of the nature of the risk, the seriousness of the problem?

Dr. LEARY. No, they did not know about the serious nature of the risk. In fact, part of the problem was a political one in the release of the information in Pennsylvania.

We were given some indication, when the testing was done, that the school system would find out the results of the testing so that parents could be prepared for the eventualities of the testing. What happened was that it almost came together all at the same time.

I received the results on the 8th of September. There was information in the newspaper the following day.

Senator LAUTENBERG. You are talking about last year?

Dr. LEARY. I am talking about 1985. The State Representative Don Snyder was called with testing results before I was notified. Several people were notified before I was about the results in my

own district, and it never gave me a chance to get together with the parents to prepare them, and especially with the faculty.

I recall going to a meeting at 7:45 in the morning, the very next morning, with a group of alarmed faculty in that school. There was very little knowledge about the radon problem at that time, and the sudden release of information caused great concern on the part of faculty and citizens.

Senator LAUTENBERG. Were the parents more agitated about it than the faculty, do you think?

Dr. LEARY. I would say equally.

Senator LAUTENBERG. They expressed their concerns.

Dr. LEARY. Yes.

Senator LAUTENBERG. Especially in an area like yours, Dr. Leary, where there is so much publicity attached to the radon problem, but even with that, we don't see an outpouring of people saying: I have got to test it. I have to fix it, and all that kind of thing.

Mr. MELLEY. Senator, could I comment on that?

Senator LAUTENBERG. Yes.

Mr. MELLEY. I concur with the gentlemen from New Jersey who stated, maybe in other terms, that there seems to be an acceptance of this as just another one of civilization's serious problems. Somehow, someway, we are going to have to elevate it beyond that level of attention to a point of major concern.

I make reference to the National Education Association's newspaper of December, 1986, where we interviewed a teacher in the Reading Prong area, who indicated, when asked the question about the building testing, "the tests were kept very quiet, and the results are not generally known." That is a statement, I think, that reflects the problem.

Dr. LEARY. We sent a letter home to every parent of every child in that building within 24 hours of the time we were notified by the State of the results. The parents all knew. They were invited in. In fact, we had each child's parents sign-off that they had received that information. We sent additional newsletters and much information out to the parents.

Senator LAUTENBERG. What did your letter say?

Dr. LEARY. It said that we had been advised by the Department of Environmental Resources that there was a health hazard in the school related to radon. We explained what radon was, all of the known information from the Pennsylvania Department of Health that we had been given. We said that we were going to take immediate action within a three-week to three-month period to mitigate the problem, to try to reduce it to acceptable levels, as we had been advised to do by DER.

We had been given information that it wasn't necessary to take the faculty and the students out of the school, at least for that period of time. Within four to five months after that, we had the construction project finished.

Senator LAUTENBERG. Did any of the parents take their kids out of schools?

Dr. LEARY. No, sir.

Senator LAUTENBERG. Would you say that the response was heated, agitated, concerned, or was it——

Dr. LEARY. It was temperate, but deep concern existed.

Senator LAUTENBERG. That is interesting.

How did you say the schools in your district bore the cost of correcting these problems?

Dr. LEARY. It came out of the general fund budget for that year. We simply had to not spend money on other things, and to use the money for that purpose within our maintenance budget.

Senator LAUTENBERG. They were not, to use the expression, budget busting type expenses. What did you say that they were on the average?

Dr. LEARY. They were $34,000, and it is a $20 million budget, so it is not a budget buster. But, obviously, if we had had 12 buildings to do that work in—this was a very small elementary school—we would have had a serious problem.

Senator LAUTENBERG. The remediation work was done by contractors?

Dr. LEARY. Yes, local contractors.

Senator LAUTENBERG. Was it done successfully?

Dr. LEARY. Yes, it was done reasonably successfully.

Senator LAUTENBERG. The testing afterwards established the fact that the job was a good one, thorough, et cetera?

Dr. LEARY. The testing brought the levels from 0.217 down to below the 0.02 to 0.04 range, which was a reduction of 90 percent of radon exposure in the school. We have had Teredex track etch monitors in the building for a period of a year now and DER will be evaluating them over this summer.

Senator LAUTENBERG. The fact that you have reduced by that huge percentage doesn't, however, challenge the remaining issue, and that is, it is still, if I heard you correctly, 0.02 working levels.

Dr. LEARY. There were around ten different readings, some below and some above that level, but we still have the concern, and DER has told us, if we put a track etch monitor in several locations in the building for a period of year, where there is continuous exposure, rather than winter exposure, or closed building exposure, we would likely see levels below the 0.02 level. If we do not, we will have to do additional work.

Senator LAUTENBERG. I am not sure, Dr. Leary, how do you come to the conclusion about the success of the mitigation results. I mean, if we are still hovering around a level that is considered a high risk level, there is still work to be done. The testing will confirm what the level is, but it doesn't, I don't think, give us much comfort, does it?

Dr. LEARY. No, sir, not as much as I would like.

Senator LAUTENBERG. We thank you very much, all of the witnesses, and the last panel as well, for your testimony.

It is a serious problem, we see that. Finally, at least, if the alarm isn't as nationwide as it ought to be, the more attention we give it here, and the more funding we give it here, at least we have a chance to make the families aware of the risks, not only in schools, but in the home.

When we have the public behind us, this problem will get solved, because it will then have the funds committed, the organizations and government committee to it. We need to work with the States. The problems are going to have to be solved at the local level, the criteria developed, and the process put in place. It all is going to

have to be done locally, but it does need, in my view, this kind of national support.

This is no different, in my view, than any other natural disaster, whether it is a hurricane, a tornado, or floods. When it threatens the health and the safety of our citizens, we find ways. There has been, in my recollection, no threat of the magnitude that this poses ever. We have never had a tornado, or an earthquake, as a matter of fact, that could be so devastating to so many people.

I don't want to raise the fears beyond reason, but sometimes you have to sound the alarm just a little bit louder to get attention to a problem than you otherwise would like. We don't want to cry fire in the theatre, but we also don't want people to sit by complacently and wonder, one day, when they see an X-ray come out of the doctor's office, or their children's health threatened, why didn't I do something earlier, and why is it that the government joined in on this. They protect us on our borders, they have weapon systems, and they have troops in the ready, and so forth, why, then, shouldn't the government step in and protect our health in the United States.

Thank you very much for being here.

Dr. LEARY. Thank you very much for your support, sir.

Senator LAUTENBERG. The hearing is now adjourned.

[Whereupon, at 12:06 p.m., the subcommittees adjourned.]

[Statements submitted for the record and the bills, S. 743 and S. 744 follow:]

OPENING STATEMENT

A. JAMES BARNES
DEPUTY ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTION AGENCY

BEFORE THE

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
SUBCOMMITTEE ON SUPERFUND AND ENVIRONMENTAL OVERSIGHT
UNITED STATES SENATE

APRIL 2, 1987

Good morning. I am pleased to be here today to discuss with you EPA's Radon Action Program and the radon legislation recently proposed by Senator Mitchell (S. 744) and Senator Chafee (S. 743). At the outset, I want to recognize the continuing interest in this serious environmental issue shown by Senator Mitchell, Senator Lautenberg, and Senator Chafee.

I also want to thank the Subcommittee Chairmen for permitting me a slightly longer oral statement this morning. A review of the Agency's existing Radon Action Program and our implementation of the Superfund Amendments and Reauthorization Act's (SARA) radon provisions seems particularly appropriate at this time as we consider the Mitchell and Chafee bills.

Exposure to elevated indoor concentrations of radon gas was first recognized as a potential health problem in the 1960's when houses were found in Colorado that had been built with materials contaminated by uranium mill tailings. In the 1970's, EPA discovered that some houses built on reclaimed phosphate lands in Florida also had elevated radon levels. In

December 1984, however, extremely high radon levels were detected in homes located on the Reading Prong, a geological formation which runs from New Jersey, through Pennsylvania, and into New York. Since that time, elevated concentrations have been found in numerous homes in many parts of the country.

Indoor radon is a serious health problem. We estimate that between 5,000 to 20,000 lung cancer deaths each year may be attributed to exposure to indoor radon. While the Agency has not yet fully documented the extent of indoor radon exposures, we believe that four to eight million homes may be affected.

Radon is a naturally-occurring substance. It is found virtually everywhere. To reduce the health risks associated with radon, we need a program that educates the public about the risks at hand, and helps citizens make informed decisions about ways in which to reduce those risks.

EPA established its Radon Action Program in 1985 in response to the serious radon problem discovered in the Reading Prong. The goal of our program is to significantly reduce the health risks of radon by forming a partnership with other Federal agencies and the States. Certain types of activities, such as research and technical studies, are best done by the Federal government. Other activities, such as providing day-to-day advice to the public and detailed analyses of local situations, are best handled by State and local agencies because of their proximity to the problem.

EPA's Radon Action Program consists of four elements:

1. To assess the extent of the radon problem nationally; (Problem Assessment)
2. To conduct research into methods of reducing radon levels in existing and new homes (Mitigation and Prevention);
3. To help States develop programs to measure and diagnose radon problems, as well as to assist the public (Capability Development); and
4. To develop information for the States to use in helping citizens understand the risks associated with radon and how to reduce them (Public Information).

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA)

Last September, Congress passed SARA which directed the Agency to undertake a number of activities to assess and reduce the risks associated with indoor radon exposure. The provisions of the law generally dovetailed with the program we had in place at that time.

In the near future, we will provide the Congress with a detailed implementation plan describing how the Agency will fulfill the requirements of Title IV of the Act, as well as the first annual status report of our mitigation efforts as required by Section 118.

PROGRAM HIGHLIGHTS

I would like to briefly review the progress we have made to date in addressing the radon issue.

Problem Assessment

We have two complementary activities underway to assess the extent of the radon problem. We are now completing the design of a national survey to better define the distribution of radon levels in houses across the country. Detectors should be in place later this year. We are also assisting States in designing and conducting their own surveys to identify potentially high radon risk areas. Ten States are currently participating in the program: Alabama, Colorado, Connecticut, Kansas, Kentucky, Michigan, Rhode Island, Tennessee, Wisconsin, and Wyoming. So far, 14 other States have requested EPA assistance to carry out surveys. A few States, such as Florida, New Jersey, and Pennsylvania, have embarked on independent surveys.

Standardized measurement methods have been issued to ensure the comparability of radon measurements. We are also gaining a better understanding of the geological factors that influence indoor radon levels. Recent developments in comparing geological characteristics to indoor radon data are encouraging. Geological mapping may be useful in identifying high risk areas.

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Mitigation and Prevention

We have been working closely with the States in conducting a research and demonstration program for reducing indoor radon levels. We began our demonstration work in eastern Pennsylvania. To date, we have successfully demonstrated mitigation techniques in approximately 38 houses in that area. These houses had initial average radon levels ranging from 6 to 1200 picocuries per liter (pCi/l). (4 pCi/l is the EPA target for corrective action.) We have been able to reduce the levels in most of the homes by more than 90 percent. In Clinton, New Jersey, ten houses were selected for a demonstration project. All the houses had initial radon levels ranging from 400 to over 1,000 pCi/l. We have reduced the levels in all ten houses by more than 98 percent. We are expanding our program into New York and Maryland and plan to increase the number of homes in New Jersey. Sites are also being considered in other States. In addition to our demonstration work of reducing radon levels in air, research is nearly complete on methods to remove radon from drinking water.

In addition to its demonstration program, the Agency has initiated the House Evaluation Program to evaluate the cost and effectiveness of mitigation methods in the private sector and to train State and private sector personnel in diagnosing and mitigating radon in houses. State personnel, in cooperation with EPA, diagnose a house with elevated levels and offer the homeowner several alternative mitigation schemes. The

homeowner chooses whether to undertake the mitigation work and selects the contractor. Eighty homes have been evaluated in Pennsylvania and mitigation work is underway. EPA plans to expand its program into New Jersey and New York, as well as other States. An additional benefit of this program is that more than 40 State officials have been given practical training in radon diagnosis and mitigation.

The results from our mitigation efforts have been very promising. Further, private contractors are successfully reducing radon levels at a reasonable cost and the number of contractors performing mitigation services is increasing.

A critical element in reducing the health risk from radon exposure is to prevent radon entry in new construction. The Agency is planning to demonstrate radon resistant techniques in up to 125 new houses in New York and other States. We are working closely with the housing industry, particularly the National Association of Home Builders, to incorporate radon resistant techniques in new construction.

Capability Development

Another important aspect of the Radon Action Program is to develop State and private sector capabilities to diagnose and reduce indoor radon levels. In cooperation with the New York State Energy Office, we have created a technical training course for Federal and State officials and private contractors. This course has been offered approximately 25 times to over 1000 State officials and private contractors. Courses have

been held primarily in the Reading Prong States. These States are using the materials developed by EPA in their own courses.

The Agency provides technical advice on radon measurement methods and calibration services to the States and private firms. With EPA's assistance, several States, including Maryland, Delaware, and Pennsylvania, either already have or are setting up their own measurement programs.

To ensure that those in the radon measurement business meet certain minimum standards, EPA established the Radon Measurement Proficiency (RMP) program. Participation in this quality assurance program is voluntary, but New Jersey is using the proficiency evaluations as a basis for certification. Other States are considering similar certification programs. The RMP program has been well-received and is growing rapidly--35 firms successfully passed in the first round, 75 in the second round, and 150 in the third round. About 400 firms are participating in the fourth round.

Public Information

As public concern about the health risks associated with indoor radon increased, the development and dissemination of public information became a high priority for the States and EPA. Last summer we issued two brochures, "A Citizen's Guide To Radon: What It Is and What to Do About It," and "Radon Reduction Methods: A Homeowner's Guide." More than 250,000 copies of these publications have been distributed by EPA and

the States. States are now reprinting copies of these brochures.

Other technical documents on radon measurement and mitigation techniques have been prepared and provided to the States and the private sector. This year we will update our technical publications to include new developments in the radon field. Two new brochures are planned--one on new house construction and another on radon in drinking water.

Radon in Water

Under the Safe Drinking Water Act, EPA must develop enforceable drinking water standards for radon and other radionuclides by June 1989. An Advance Notice of Proposed Rulemaking was published in September 1986. It contains much of the occurrence, exposure, risk, detection, treatment and cost information that will serve as the basis for proposed maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for these materials. The proposed rule will be published by January 1988, and the final rule will be promulgated by June 1989, the statutory deadline.

In addition to the enforceable limit on the concentration of radon which may be present in water provided by public water systems, the rules will include features which will enable States to determine that water systems are in compliance. Requirements for acceptable analytical methods for measuring radon in drinking water and monitoring and reporting will be included. Treatment techniques that will effectively remove

radon and can be used to meet the standard or must be installed to obtain a variance from the standard will be listed. Grants are given to States for program implementation. Each State determines what portion of its grant is spent on radon-related activities.

FEDERAL COORDINATION

Several Federal agencies are working with EPA to address the radon problem. The Department of Energy (DOE) is conducting health effects, epidemiological, and building science studies. We are close to finalizing a Memorandum of Understanding with DOE to coordinate our programs. DOE will have primary responsibility for basic research with their primary focus on health studies; EPA will be responsible for applied research, technical studies, and operational programs dealing with the States and the private sector.

We also have an interagency agreement with the U.S Geological Survey to provide geological data to States for use in designing their surveys. The Centers for Disease Control collaborated with EPA in developing "A Citizen's Guide to Radon."

These and other Federal agencies are members of two interagency committees, the Committee on Indoor Air Quality (CIAQ) and the Committee on Interagency Radiation Research and Policy Coordination (CIRRPC). These committees review research needs, identify key policy questions, and coordinate the objectives of our various programs. Through these committees

and informal relationships, EPA staff is in constant contact with the other Federal agencies to coordinate our respective efforts.

STATE PROGRAMS

The success of our efforts to date rests on the partnership that has developed with the States during the past two years. States are in the best position to take the lead in coordinating Federal and local efforts to address this unique environmental problem. All States have an existing network of environmental, health, and radiation protection agencies with considerable experience in responding to local problems. States can also assist local governments that are beginning to develop monitoring and public education programs. In addition to this network, States have extensive technical knowledge and experience in areas such as local geology, building codes, real estate issues, and land use planning.

Generally, States are assuming primary responsibility for assisting homeowners to reduce their risks from radon exposure. States are responding to inquiries from homeowners and in some cases have developed public education and outreach programs. Some States are initiating efforts to identify problems and develop appropriate responses. For example, independent local surveys have been conducted in at least 11 States. As mentioned previously, many States are interested in participating in the cooperative EPA-State survey assistance program to locate potential high-risk areas and to determine

the distribution of radon levels throughout their State. Approximately 40 States have participated in EPA's Radon Diagnostician and Mitigation Training Program. In the future, we hope that many States will develop their own training programs for local officials and private contractors.

Some State legislatures are beginning to develop responses to specific problems encountered by the State. Legislative initiatives that have been proposed or enacted include establishing State radon offices, earmarking resources for radon programs, creating low-interest loan programs for radon reduction, and requiring certification of private monitoring and measurement companies. We expect more States to develop legislative initiatives in the future.

EPA's approach is to help States become fully capable of meeting their responsibility as quickly as possible. To achieve this, EPA is transferring technical information to the States. The types of direct assistance EPA provides include:

- Designing and conducting State surveys;
- Hands-on experience in diagnostic evaluation;
- Consultation on development of State programs;
- Analytical services;
- Training courses and informational materials; and
- Advice and technical information on radon mitigation.

Most States will require some or all of these types of assistance. These services provide a catalyst for States developing their own programs. As more radon problems are

documented, we expect that more States will need EPA assistance to develop their programs.

FUTURE DIRECTION

For the past two years our efforts have been directed toward meeting the urgent needs of the States affected by the Reading Prong. In the future, we will focus on fulfilling the requirements of SARA and assisting those States which are now finding elevated levels.

We are expanding our mitigation efforts into States outside the Reading Prong and will include a variety of housing types in various climates. We will be working with building code organizations to ensure that radon-resistent techniques are incorporated into new construction practices through modifications to local building codes.

We will continue to provide technical assistance to States to enable them to develop radon programs and expand private sector capabilities. Several of the programs we developed in response to the needs of the Reading Prong will be continued and expanded to assist other States.

With the anticipated growth in the radon measurement industry, our quality assurance program will continue to provide a critical service to the States and the public.

We will also work to provide States with some of the information necessary to help homeowners understand and evaluate the radon problem. An effective public education

program is an essential component of EPA's approach to reducing risks from indoor radon.

We are pleased with the results of our initial efforts. States are accepting their responsibilities and are helping citizens reduce their risk from indoor radon. By strengthening this Federal-State partnership, we can achieve our mutual goals of reducing the public health risk from radon.

PROPOSED LEGISLATION

The radon legislation proposed by Senator Chafee and Senator Mitchell is, in some ways, consistent with the approach of EPA's Radon Action Program. Both bills recognize that State and local governments must ultimately bear primary responsibility for assisting the public. Similarly, both bills recognize that, particularly with regard to questions of national problem assessment and technical assistance, there is a limited but unique and necessary Federal role. Also, both bills recognize that a cooperative relationship between Federal and State efforts is the best way to effectively deal with this public health problem. As you might expect, we have concerns about some specific provisions in both bills, but we are also pleased to see several components that are generally consistent with the Agency's approach to this problem.

State Radon Program Development Act (S. 744)

We believe that the Federal-State partnership is working. The substantial progress made by EPA and the States that I have just outlined has occurred during just two years. It is a

prudent, equitable, and long-lasting approach to a very difficult public health problem.

The Mitchell legislation would expand and accelerate EPA technical assistance to the States. The bill directs EPA to enhance its comprehensive program of technical assistance to the States by establishing a clearinghouse on radon issues, certifying radon measurement devices, demonstrating mitigation methods, conducting training seminars, and developing a national data base.

Many of these and other technical assistance initiatives contained in the Mitchell bill are consistent with our existing Radon Action Program or represent extensions of ongoing activities. While we would question the need for some provisions (including a Federal certification program for measurement devices) the Agency generally supports Section 4 (Technical Assistance to States) of the bill.

Section 5 of S. 744 would establish a new grant assistance program for the States, providing seed money to help States initiate and develop radon-related programs. It would authorize $10 million annually for FY 1988 through FY 1990 under a 75%/25% Federal-State funding formula. Grants would be made on the basis of problem severity, the likelihood of success in radon control, and each State's need.

While the Agency cannot support the Federal Radon Grant Assistance program as currently drafted, the Mitchell bill could increase the speed at which States will become self-sufficient in meeting the needs of the public. As I have stressed here this morning, our experiences over the past two years lead us strongly to the conclusion that some States are able, willing, and far better qualified than the Federal government to assist individuals in making the proper choices about radon.

I'd like to mention a few examples of that success. In all States, our Radon Measurement Proficiency Program has generated a list of reputable firms in which homeowners can have confidence. This has avoided creation of a quality assurance program in every State. With respect to training, EPA's diagnostician and mitigation training program has now been modeled by several States; over 1,000 State and local officials and contractors have been trained. The Agency's small House Evaluation Program helped Pennsylvania diagnose radon problems in about 80 homes. In turn, Pennsylvania will fund mitigation efforts in over 100 homes this year. EPA has spent about $200,000 on this project; Pennsylvania will commit about $1 million to it.

Our experience also indicates, moreover, that modest initial Federal expenditures have leveraged greater investments

by State and local governments. Pennsylvania and New Jersey are now each committing State resources greater than the Federal government's investment in each of those States.

Once a radon problem has been discovered, a State must react quickly to establish credibility with its citizens. If it fails, the public will look to the Federal government for assistance, potentially requiring a larger and more enduring Federal program. In the few States that we have worked with, this situation has been averted by providing the tools necessary to States to anticipate and respond to public concerns.

Radon Detection in School Buildings Act (S. 743)

EPA agrees with the fundamental thrust of S. 743 that it is important to obtain an accurate picture of radon levels in schools. Because school buildings are generally large structures with considerable contact with the ground, they can contain significant amounts of radon. In addition, schools may expose children to high levels of radon early in their lives and therefore lengthen the period of their highest exposures and increase their overall probability of lung cancer significantly.

Although EPA has not yet taken radon measurements in schools, we are aware of some limited data collected in Pennsylvania, New Jersey, and New York. Pennsylvania has

tested 140 schools, and found 47 buildings with levels greater than 4 pCi/l, EPA's target for remedial action. About 41 schools in New Jersey have radon levels slightly above 4 pCi/l and one school in New York has been found with elevated levels. This preliminary information suggests that problems in schools are likely to be geographically localized and in specific areas in school buildings, such as ground floor or basement classrooms.

The Chafee legislation appears to have three key objectives: to identify high risk school districts, to determine the distribution of radon levels in schools across the country, and to provide mitigation information. It also provides for States to take the lead in initiating assessments of schools, using technical assistance from EPA.

Similar to its approach with residences, EPA believes that State and local governments are in the best position to assess and address radon problems in schools, but we recognize that the Federal government can provide valuable technical information and assistance to the States. In this regard, the Chafee legislation is consistent with EPA's overall radon strategy.

As required under SARA, EPA will, in the future, assess radon levels in schools and will work closely with States to

determine those localized problem areas. Some work has already been done by a few States, such as limited mitigation projects in schools, and more is likely to follow. Through this Federal-State partnership, high risk areas should be identified and some mitigation efforts will be undertaken.

We have other technical concerns regarding both bills which we will provide to your staff separately.

At this time, I would like to conclude my formal remarks, and answer any questions you may have.

SENATOR JUDY C. KANY
DISTRICT 17

State of Maine
Senate Chamber
Augusta, Maine 04333

STATEMENT OF
MAINE STATE SENATOR JUDY C. KANY

BEFORE THE
SUBCOMMITTEES ON ENVIRONMENTAL PROTECTION
AND SUPERFUND AND ENVIRONMENTAL OVERSIGHT
AND THE
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES CONGRESS
APRIL 2, 1987

Senator Mitchell, Senator Lautenberg, and Senators, thank you for this opportunity.

My name is Judy Kany. I am a state Senator and Chair Maine's Advisory Commission on Radioactive Waste which advises both the Governor and Legislature on radioactive waste managment issues.

I wish to address three areas in my five minutes. They are the extent of the radon problem in Maine, what current efforts Maine is making to address radon contamination, and in what areas federal assistance would be most helpful.

The Radon Problem in Maine

Research on the presence of radon in Maine homes is not a recent phenomenon. A bibliography attached to my written testimony traces some of the efforts we have made to understand the nature and the extent of radon contamination in soil, water and air. Much of the early research in Maine focused on radon in ground water. Later investigations looked at the transfer of radon from household water to household air. Research has also been undertaken on techniques designed to prevent the influx of radon from water and soil into the indoor air. Most recently, a cooperative study by private hospital, university, and state agency personnel has, and continues to, investigate the potential for lung cancer risk that is associated with domestic radon exposure. Most of my comments are based on these studies or conversations with the researchers themselves. High levels of both water and airborne radon have been reported in Maine homes and I would like to speak first about the incidence of radion in ground water.

Water

Much of Maine is underlain by granite plutons and metamorphic rocks that vary in the extent they were altered by heat and pressure. The presence of uranium and radium in these rock structures and in the soil overburden has led to many domestic water tests with high levels of radon. Maine has had radon levels in water from a private well as high as 1.7 million picocuries per liter, one of the highest radon water readings ever recorded. Radon air levels at this home were above 100 picocuries per liter in living areas and rose to more than 2,000 picocuries per liter in the bathroom when water was used. While most users of public water supplies are not exposed to significant levels of radon from their water, Maine has more than 100,000 households with privately-owned wells. In a majority of Maine towns, more than 20 percent of the households are served by individual drilled wells. High radon water values (more than 20,000 picocuries per liter) are concentrated in towns located in south-central and southern Maine, the regions where most Mainers live.

Recent preliminary analysis of data collected from 500 Maine homes with drilled wells showed the metamorphic grade of the bedrock was strongly associated with water radon levels. The mean radon level tripled from low-grade to highly altered rock, and doubled from high-grade metamorphic rock to granite. The authors estimate that 10 percent of the homes in Maine with private wells have water radon levels above 20,000 picocuries per liter. A 1983 study indirectly corroborates these findings. In that study granite rock in Maine had an average radon level of 15,000 picocuries per liter. The state Bureau of Health currently recommends remedial action be taken if radon water levels exceed 20,000 picocuries per liter.

The risk associated with radon in water is not so much from drinking the water (although some risk of developing stomach cancer does exist), but from transfer of radon from the water to the air. At the rule of thumb water to air transfer rate of radon, 10,000:1, 20,000 picocuries of radon per liter of water could contribute two picocuries per liter of air to a home. More than 10,000 households in Maine may have water originating radon levels in their air of two picocuries per liter. A potential 18,500 households receive one or more extra picocuries per liter of radon from their water supply. The Environmental Protection Agency estimates that 3 to 13 people per thousand face a lifetime risk of lung cancer from a radon dose approximately equivalent to air exposure of one picocurie per liter (based on 10,000:1 water to air transfer coefficient).

Air

For many years researchers in Maine thought our radon air levels were a result of the high radon water levels. Although radon water levels are clearly a contributing factor, recent data suggest that, as in other areas of the country, radon gas is entering homes through cracks in basement walls and floors, floor drains, and other openings. The 500 home study mentioned previously indicates that 14 percent of Maine homes with private wells (a condition of entering the study) have radon air levels in excess of 4 picocuries per liter, the EPA recommended level for taking remedial actions. Twenty percent of the homes with high radon air levels had low levels of radon in their water supplies. Other studies have indicated that the average indoor radon air levels in six Maine counties were above 2 picocuries per liter. These counties have 650,000 people, 55 percent of the state's population.

Current Efforts in Maine

Maine has recognized the potential health hazard that radon poses for several years. The research undertaken in Maine, much of it by the University of Maine and the Department of Human Services' Bureau of Health, has been directed at determining the extent of radon contamination in Maine homes and most recently has attempted to determine the health threat to individuals. Researchers from Maine's largest hospital, the Bureau of Health, the Maine Geological Survey, and the University have been conducting a study to assess the potential for lung cancer risk associated with domestic radon exposure in Maine. Some of the preliminary results of this study were mentioned above. Recently, these researchers (and others) have applied for EPA funding to continue examining the health implications for individuals exposed to domestic radon. This research will continue testing the association between radon exposure and lung cancer while also investigating the influence of smoking on dose response and the influence of water radon and housing characteristics on indoor air radon concentration.

Currently, the state of Maine has no programs that deal solely with radon. The Bureau of Health does run an Occupational and Residential Health Program through its Division of Health Engineering. This program provides radon testing devices for air and water at a cost of $18-22 per test. Two types of measurements for radon are recommended; an initial screening test to determine if a house may have a problem and a follow-up test to determine appropriate remedial action. For screening purposes, a house on a public water supply should perform an air radon test at the lowest livable area. A house on a private water supply should perform the same air radon test plus a water radon test; it is also recommended to do a gross alpha test for

non-radon natural radioactivity. Follow-up tests should be used to better evaluate the health risk in the living area plus appropriate remedial action. Unfortunately, this program has two staff people and one half-time secretary to perform all testing and educational activities for radon, lead-related problems, formaldehyde, gasoline, toxics, ventilation problems, combustion-related problems, and assistance to medical professionals. Demand for the radon testing and education activities alone exceeds the available staff time. Staff has become increasingly selective in following up with people whose initial screening tests indicate the need for follow-up tests and remedial action. Some requests for educational presentations are being refused for lack of personnel to handle the number of air and water tests being requested. As of June 1986, this program had tested 1,500 air samples and 3,200 water samples for radon. Graphs summarizing the data are attached. Thirty percent of the 1500 homes tested for airborne radon showed a reading above 4 picocuries per liter. In the past nine months there have been more than 1,000 tests on water samples and more than 1,000 tests on air samples. The average radon level in air tests performed by the Division of Health Engineering is 3.9 picocuries per liter. An additional 390 gross alpha tests were performed in 1986.

Areas of Need -- Basic Research, Education, and Demonstration Programs

*More personnel and equipment for Division of Health Eng.

*Development and promotion of educational programs targeted at specific groups; eg. realtors, wastewater treatment specialists, contractors and citizen groups.

*School testing. Maine has 743 public schools and 108 private schools; at least two screening tests per school would be needed. Schools with drilled wells should be given priority.

*Establishment of a radon "hot line" to address concerns.

*Appropriate safe disposal of contaminated materials and contaminated well water by products.

*Study of lung cancer - versus radon levels from water and soil gas in Maine settings for both high and low levels to aid in setting national standards.

*Field studies in Maine to find the high soil - gas radon areas.

*Need for accurate inexpensive soil radon tests for homesites to alert the builders when special construction methods should be used. Existing tests do not address soil porosity.

*Study of transfer of radon from water into air to help in the formation of a meaningful radon in water standard for the United States.

*Construction of model radon-free homes to illustrate methods for builders. Research into retrofitting old homes is needed to make radon removal more economical. This can be coupled to a program sealing out radon and providing ventillation for the high radon homes already found.

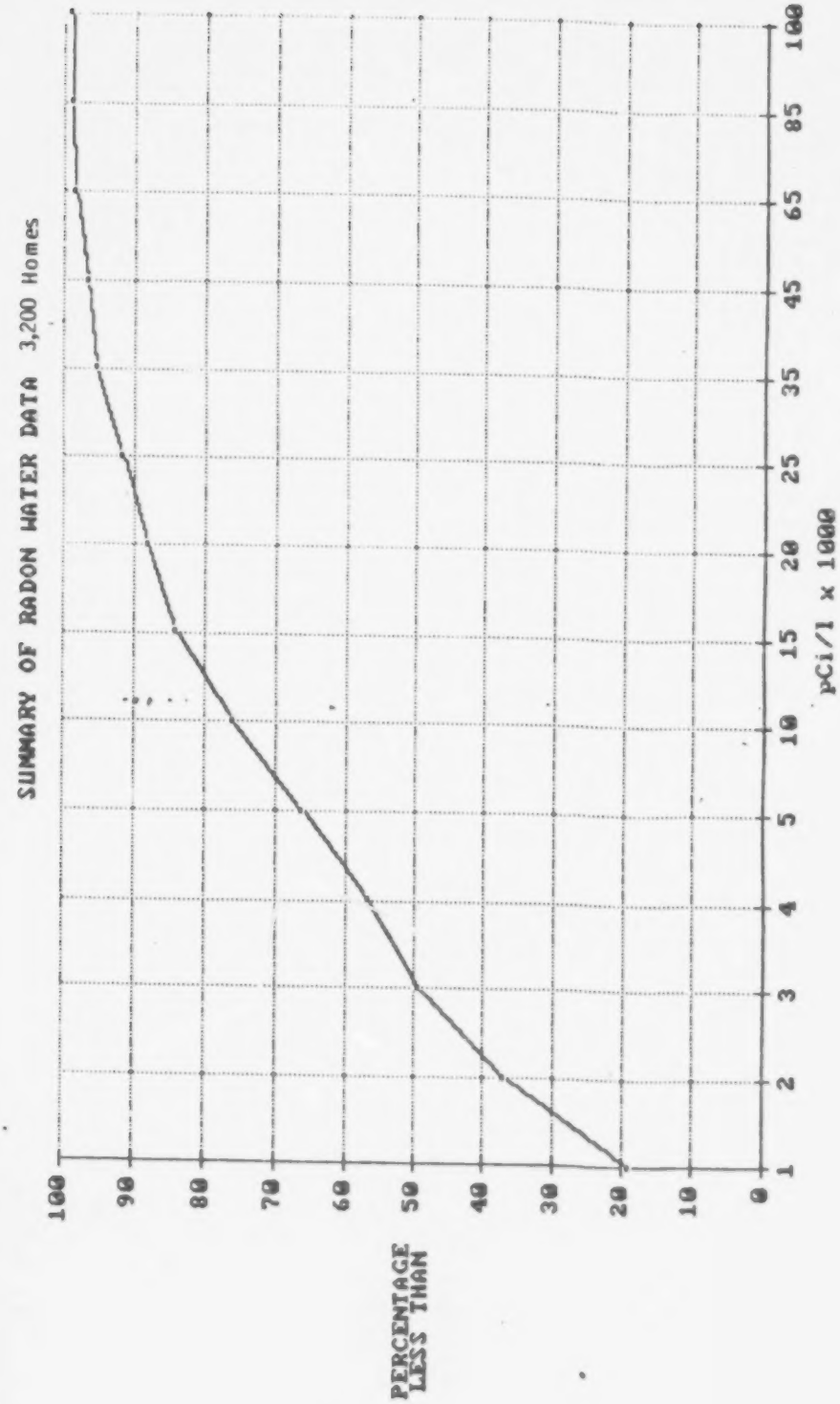
*Expanded research to determine actual health risk.

Conclusion

The basic and applied research needs to be done, people need to be educated more about radon and what can be done about it, and demonstration projects would be extremely helpful.

Unlike so many of the public health programs your subcommittees address, a relatively small investment can make a huge difference. We have a known health risk, a problem that can be anticipated and controlled. High radon levels in a confined area can be remedied.

Therefore, we Mainers who are familiar with the radon problem in Maine, are strongly supportive of the effort and thrust of Sen. Mitchell's and Sen. Chaffee's legislation -- the "State Radon Program Development Act of 1987" and the "Radon Detection in School Buildings Act."


SUMMARY OF RADON WATER DATA 3,200 Homes
PERCENTAGE LESS THAN
100
90
80
70
60
50
40
30
20
10
0
1
2
3
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25
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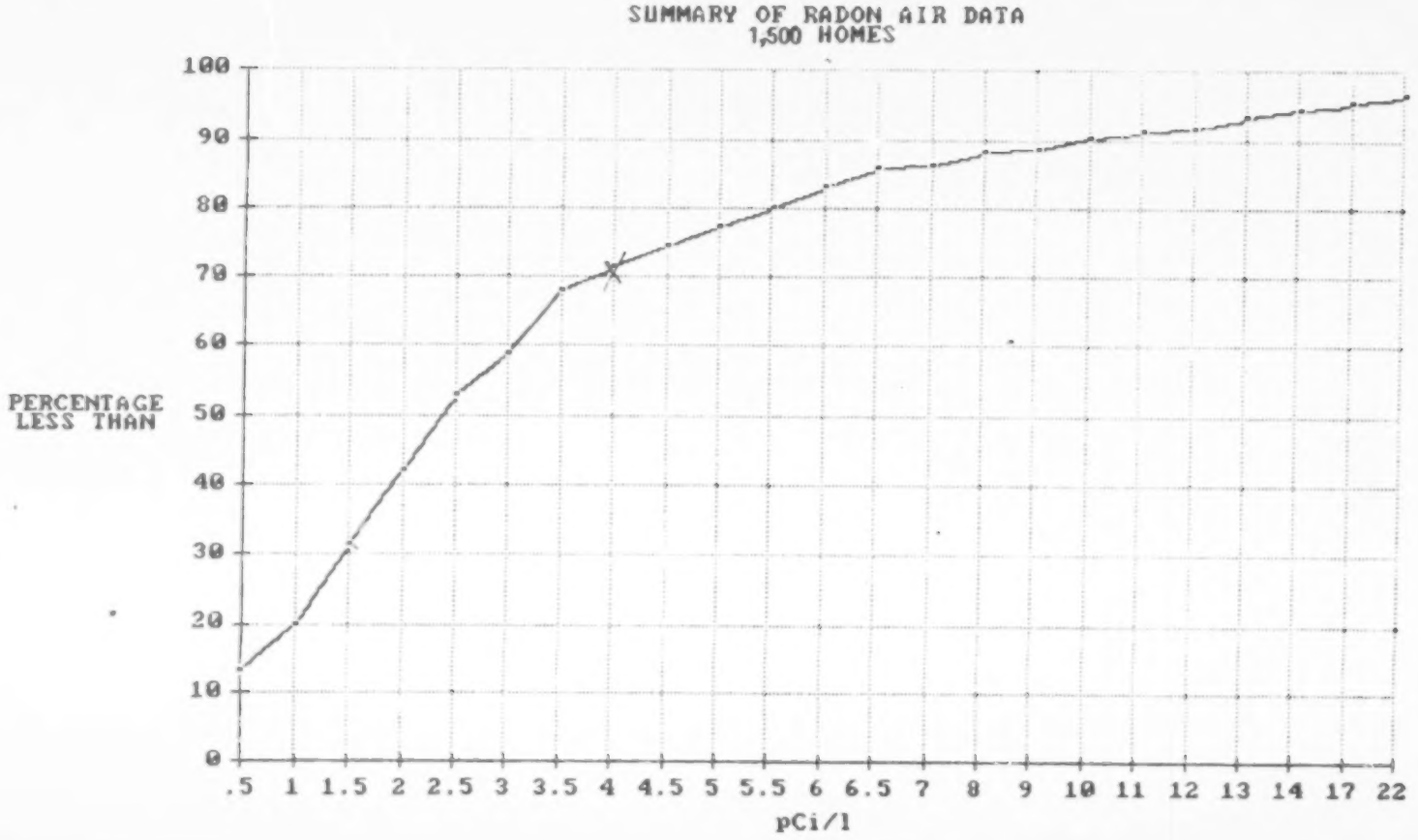
SUMMARY OF RADON AIR DATA
1,500 HOMES
PERCENTAGE LESS THAN
100
90
80
70
60
50
40
30
20
10
0
.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 8 9 10 11 12 13 14 17 22
pCi/l

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HEALTH THREATS POSED BY RADON GAS

TESTIMONY OF DONALD A. DEIESO
ASSISTANT COMMISSIONER OF ENVIRONMENTAL MANAGEMENT AND CONTROL
NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

PRESENTED TO THE JOINT HEARING OF THE SUBCOMMITTEES ON ENVIRONMENTAL PROTECTION AND SUPERFUND AND ENVIRONMENTAL OVERSIGHT OF THE SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE

WASHINGTON, D.C. -- APRIL 2, 1987

SENATOR LAUTENBERG, SENATOR MITCHELL, MEMBERS OF THE SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION AND THE SUBCOMMITTEE ON SUPERFUND AND ENVIRONMENTAL OVERSIGHT -- GOOD MORNING.

MY NAME IS DONAID DEIESO. I AM ASSISTANT COMMISSIONER FOR ENVIRONMENTAL MANAGEMENT AND CONTROL OF THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION. I APPRECIATE THIS OPPORTUNITY TO PRESENT COMMENTS ON BEHALF OF THE STATE OF NEW JERSEY WITH REGARD TO THE HEALTH THREATS POSED BY RADON GAS.

THE RADON PROBLEM IN NEW JERSEY IS THE MOST SERIOUS STATE ENVIRONMENTAL AND PUBLIC HEALTH PROBLEM THAT WE HAVE IDENTIFIED. POTENTIALLY TWO-THIRDS OF OUR POPULOUS STATE MAY BE AFFECTED BY RADON CONTAMINATION. WE ESTIMATE THAT MORE THAN 2 MILLION HOMES ARE AT RISK DUE TO THIS CONTAMINATION. CURRENTLY, 28% OF THE HOMES THAT ARE SCREENED REQUIRE ADDITIONAL MONITORING DUE TO HIGH LEVELS OF RADON. SO FAR, APPROXIMATELY 100 HOMES HAVE BEEN FOUND TO HAVE LEVELS GREATER THAN 200 PICOCURIES PER LITER. ONE TOWN, CLINTON, IN THE NORTHWESTERN PART OF THE STATE (OFF THE READING PRONG), WAS IDENTIFIED AS BEING A MAJOR RADON CLUSTER WITHIN THE STATE.

IN THIS TOWN, OUR REMEDIATION PROGRAM SUCCEEDED SO WELL THAT WE WILL BE USING IT AS A MODEL FOR RADON REMOVAL ACROSS THE STATE. THIS SUCCESS STORY IS BASED ON ALL LEVELS OF GOVERNMENT WORKING TOGETHER.

NEW JERSEY HAS TAKEN MANY STEPS IN RESPONSE TO THE RADON PROBLEM. WIDE PUBLICITY SURROUNDING THE WATRAS CASE IN PENNSYLVANIA CAUSED THE STATE'S RADIATION PROTECTION PROGRAM MUCH CONCERN. OUR GEOLOGISTS NOTED THAT THE READING PRONG, WHICH HAD BEEN IDENTIFIED AS THE KEY CULPRIT IN THE WATRAS CASE, CUTS A WIDE SWATH THROUGH SOME OF THE MOST DENSELY POPULATED AREAS OF NEW JERSEY. AS THE STATE BEGAN TO FORMULATE AN ACTION PLAN, A FRONT-PAGE NEW YORK TIMES ARTICLE CATAPULTED THE RADON ISSUE INTO THE PUBLIC ARENA. WHILE THE THOUSANDS OF PHONE CALLS RECEIVED CHALLENGED OUR INSTITUTIONAL RESOURCES, THIS PUBLICITY WAS QUITE FORTUITOUS, SINCE IT FOCUSED LEGISLATIVE ATTENTION ON RADON. IN COOPERATION WITH SEVERAL LEGISLATORS, WE WERE ABLE TO DEVELOP A STATEWIDE RADON PROGRAM AND HAVE RECEIVED $4.2 MILLION FOR USE BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE DEPARTMENT OF HEALTH TO IMPLEMENT THIS PROGRAM. HERE ARE THE KEY ELEMENTS OF THAT PROGRAM:

1. A $1.3 MILLION STATEWIDE SCIENTIFIC STUDY TO IDENTIFY THE POTENTIAL SOURCES OF CONTAMINATION IN THE STATE. THE STUDY WILL LOOK AT DEMOGRAPHIC, GEOLOGIC AND GEOGRAPHIC AREAS SUBJECT TO AN ACTUAL OR POTENTIAL THREAT OR DANGER OF CONTAMINATION. IT WILL ALSO DEVELOP A COST EFFECTIVE STRATEGY FOR RADON GAS CONTAMINATION TESTING.

2. THE NEW JERSEY DEPARTMENT OF HEALTH IS CURRENTLY DOING AN EPIDEMIOLOGICAL STUDY TO EXAMINE THE RISKS ASSOCIATED WITH RADON IN NEW JERSEY. IN THIS STUDY, THE DEPARTMENT OF HEALTH IS ASSESSING WHETHER HISTORICAL RISK ESTIMATES OF RADON EXPOSURE DUE TO URANIUM MINING ARE VALID FOR RADON EXPOSURE IN HOMES.

3. THE DEPARTMENT OF ENVIRONMENTAL PROTECTION HAS A RADON INFORMATION PHONE LINE. THIS IS A TOLL-FREE PUBLIC TELEPHONE SERVICE TO ANSWER QUESTIONS FROM RESIDENTS OF THE STATE CONCERNING RADON GAS CONTAMINATION. WE HAVE RECEIVED MORE THAN 30,000 CALLS SINCE INSTALLING THIS INFORMATION SERVICE 18 MONTHS AGO. THIS INFORMATION LINE IS A KEY TOOL IN PROVIDING ANSWERS TO SPECIFIC QUESTIONS AS WELL AS A SOURCE FOR WRITTEN MATERIALS.

4. THE DEPARTMENT OF ENVIRONMENTAL PROTECTION HAS DONE CONFIRMATORY TESTING ON OVER 1,300 HOMES DURING THE PAST 18 MONTHS. THIS IS DONE BY REQUEST OF THE HOMEOWNER, IN THOSE HOMES WHICH HAVE PRELIMINARY READINGS GREATER THAN FOUR PICOCURIES PER LITER. THIS CONFIRMATORY TESTING HAS REINFORCED OUR BELIEFS THAT THE PRIVATE CONTRACTORS WHO ARE TESTING FOR RADON CONTAMINATION ARE DOING A RESPONSIBLE JOB.

5. THE NEW JERSEY HOUSING AND MORTGAGE FINANCE AGENCY NOW HAS A LOW INTEREST LOAN PROGRAM FOR THE FINANCING OF RADON REMEDIATION. THIS LOAN PROGRAM WILL PROVIDE THE HOMEOWNER WITH UP TO $15,000 AND A REPAYMENT PERIOD OF UP TO TEN YEARS. IT IS TOO EARLY TO JUDGE THE SUCCESS OF THIS PROGRAM SINCE IT WAS ONLY ESTABLISHED THREE MONTHS AGO.

6. THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION HAS ESTABLISHED A CERTIFICATION PROGRAM FOR FIRMS WHO TEST FOR AND/OR REMEDIATE RADON CONTAMINATION. AS OF NOW, NEW JERSEY HAS MORE THAN 85 FIRMS INVOLVED IN THE TESTING AND/OR REMEDIATION OF RADON CONTAMINATION. TO DATE, WE HAVE CERTIFIED 50 OF THESE FIRMS AND HAVE BEEN SUCCESSFUL IN DISCOURAGING SEVERAL UNSCRUPULOUS FIRMS FROM DOING BUSINESS IN THE STATE.

7. NEW JERSEY HAS TWO ONGOING REMEDIATION RESEARCH PROJECTS. THE FIRST, IN THE TOWN OF CLINTON, HAS BEEN QUITE SUCCESSFUL. WE HAVE DRAMATICALLY REDUCED THE RADON LEVELS IN TEN TEST HOMES IN THE TOWN OF CLINTON. IN THIS PROGRAM,CONDUCTED JOINTLY WITH EPA, THE RADON LEVELS WERE REDUCED IN THE HOMES BY MORE THAN 98% AT AN AVERAGE COST OF $1,500 PER HOME. THESE HOMES HAD SOME OF THE HIGHEST LEVELS WITHIN THE STATE OF NEW JERSEY RANGING FROM 200 TO 2,400 PICOCURIES PER LITER. THE SUCCESS OF THIS PROGRAM HAS BEEN NOTED BY THE PRESS AND THE COMMUNITY, PROVIDING THE DEPARTMENT WITH A MUCH NEEDED BASE OF SUPPORT AS WE EXPLORE OTHER AREAS IN THE STATE WHICH MAY HAVE EQUALLY HIGH LEVELS.

THE SECOND REMEDIATION RESEARCH PROJECT IS A JOINT ENVIRONMENTAL PROTECTION AGENCY/LAWRENCE BERKELEY LABORATORIES/PRINCETON UNIVERSITY STUDY. APPROXIMATELY 30 HOMES ARE BEING STUDIED THROUGHOUT THE STATE BY THESE THREE GROUPS. THEIR RESEARCH WILL BE OF GREAT HELP TO US IN OUR EFFORT TO FIND THE MOST COST EFFECTIVE APPROACH TO RADON REMEDIATION IN NEW JERSEY.

8. AN ACTION PLAN IS IN PLACE FOR IDENTIFICATION OF RADON "CLUSTERS" AND NOTIFICATION OF THE PUBLIC OFFICIALS AND HOMEOWNERS. A STANDARD PROTOCOL BEGINS WHENEVER A HOME IS FOUND TO HAVE A RADON LEVEL GREATER THAN 200 PICOCURIES PER LITER. DUE TO THE HIGH DEGREE OF SENSITIVITY WHICH HOMEOWNERS EXPERIENCE (RELATED BOTH TO PERSONAL HEALTH CONCERNS AND PROPERTY VALUES), THE DEPARTMENT OF ENVIRONMENTAL PROTECTION HAS DEVELOPED A SYSTEM WHICH INCLUDES RAPID NOTIFICATION AND PUBLIC MEETINGS DESIGNED TO EDUCATE, QUELL FEARS AND QUASH RUMORS.

9. THE DEPARTMENT OF ENVIRONMENTAL PROTECTION IS DEVELOPING A PUBLIC INFORMATION PROGRAM TO EDUCATE CITIZENS THROUGHOUT THE STATE CONCERNING RADON, ITS RISKS AND HOW TO TEST HOMES. THE PROGRAM WILL USE BROCHURES, SLIDE SHOWS AND VIDEOTAPES IN A VARIETY OF SETTINGS RANGING FROM INDIVIDUAL HOMES TO LIBRARIES AND TOWN MEETINGS. ONE IMPORTANT ASPECT OF THIS PROGRAM IS USE OF PUBLIC HEALTH OFFICERS THROUGHOUT THE STATE. HEALTH OFFICERS WILL BE TRAINED AND PROVIDED WITH MATERIALS TO MAKE LOCAL PRESENTATIONS. IN A STATE LIKE NEW JERSEY, WITH 567 MUNICIPALITIES, DEVELOPMENT OF A LOCAL NETWORK FOR EDUCATION IS CRITICAL TO OUR SUCCESS.

10. THE NEW JERSEY DEPARTMENT OF COMMUNITY AFFAIRS WAS APPROPRIATED FUNDING BY THE NEW JERSEY LEGISLATURE TO INVESTIGATE AND ANALYZE RADON PREVENTION TECHNIQUES FOR NEW CONSTRUCTION IN SINGLE FAMILY HOMES. THE DEPARTMENT OF COMMUNITY AFFAIRS IS WORKING WITH THE NEW JERSEY BUILDERS ASSOCIATION, THE ENVIRONMENTAL PROTECTION AGENCY AND THE DEPARTMENT OF ENVIRONMENTAL PROTECTION ON THIS PROJECT.

NEW JERSEY HAS ENCOUNTERED TWO MAJOR PROBLEMS DURING THE PAST 18 MONTHS IN RESPONDING TO THE RADON PROBLEM. ONE IS THE PROBLEM OF "EDUCATED APATHY" AMONG SOME OF ITS CITIZENS. PUBLIC OPINION SURVEYS HAVE SHOWN US THAT WHILE MANY PEOPLE KNOW ABOUT RADON, ONLY FIVE TO TEN PER CENT, STATEWIDE, HAVE TESTED THEIR HOMES. THIS INDIFFERENCE IS DISTURBING TO US AS PUBLIC OFFICIALS AND POTENTIALLY HAZARDOUS TO OUR CITIZENS. THE SECOND MAJOR PROBLEM ENCOUNTERED IS OUR LACK OF FINANCIAL RESOURCES TO PROPERLY ADDRESS THE RADON CONTAMINATION IN OUR STATE. ALTHOUGH THE NEW JERSEY LEGISLATURE HAS PROVIDED US WITH FUNDING WHICH MAY SOUND GENEROUS, THEY HAVE ENDOWED US WITH GENEROUS RESPONSIBILITIES AS WELL. IN FACT, THE INITIAL $4.2 MILLION BEING SHARED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE DEPARTMENT OF HEALTH WILL SOON RUN OUT. WE FIND THAT WE HAVE INSUFFICIENT RESOURCES TO PROVIDE FOR THE NECESSARY CONTINUATION OF A RADON PROGRAM IN NEW JERSEY, INCLUDING INCREASED CONFIRMATORY TESTING AND MORE RADON REMEDIATION RESEARCH.

IN OUR VIEW, THE ENVIRONMENTAL PROTECTION AGENCY HAS PROVIDED US WITH EXCELLENT TECHNICAL ASSISTANCE BOTH IN WASHINGTON AND THROUGH REGION II IN NEW YORK. WE HAVE FOUND THAT THEIR INFORMATIONAL LITERATURE IS WELL WRITTEN AND EASILY UNDERSTANDABLE BY THE PUBLIC. OUR ONLY CONCERN HAS BEEN THAT IN THEIR LITERATURE THE HIGH END OF THE RISK ESTIMATES OF RADON EXPOSURE HAS BEEN OVEREMPHASIZED.

IF FEDERAL FINANCIAL ASSISTANCE WERE AVAILABLE, WE WOULD USE IT IN TWO MAJOR AREAS: PUBLIC OUTREACH AND CONFIRMATORY TESTING. NEW JERSEY BELIEVES THAT A STRONG PUBLIC OUTREACH PROGRAM SHOULD BE THE CORNER STONE OF A RADON PROGRAM. WE HAVE FOUND, HOWEVER, THAT TO RUN A GOOD PUBLIC OUTREACH PROGRAM DEMANDS LARGER RESOURCES. WE WOULD BENEFIT GREATLY IN THIS AREA FROM EITHER DIRECT FINANCIAL SUPPORT OR INFORMATIONAL LITERATURE. NEW JERSEY WOULD LIKE TO FURTHER ITS CONFIRMATORY TESTING PROGRAM IN THE FUTURE; BUT THIS HAS BEEN QUITE DIFFICULT DUE TO OUR CURRENT FINANCIAL CONSTRAINTS. FINANCIAL ASSISTANCE WOULD GO FAR IN THIS AREA ALSO.

THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION HAS REVIEWED THE THREE SENATE BILLS AND HAS THE FOLLOWING COMMENTS ON THEM:

-- THE STATE RADON PROGRAM DEVELOPMENT ACT: WE ARE VERY SUPPORTIVE OF THIS BILL. WE FIND THE BROAD SCOPE OF USES AND THE COST SHARING PLAN TO BE EXCELLENT FEATURES OF THIS LEGISLATION. HOWEVER, WE WOULD REQUEST THAT THE COST OF TESTING DEVICES NOT BE RESTRICTED TO 10% OF THE GRANT.

-- THE RADON MITIGATION CLARFICATION ACT OF 1987: WE ARE QUITE SUPPORTIVE OF THIS BILL ALSO. IN NEW JERSEY, WE HAVE A PIECE OF LEGISLATION MOVING IN OUR ASSEMBLY TO PROVIDE FOR A STATE INCOME TAX DEDUCTION FOR RADON REMEDIATION. THERE IS LARGE SUPPORT FOR LEGISLATION OF THIS TYPE IN THE STATE.

-- THE RADON DETECTION IN SCHOOL BUILDINGS ACT: WE HAVE TESTED 41 SCHOOL BUILDINGS IN THE STATE OF NEW JERSEY AND 21 OF THESE BUILDINGS HAD LOCATIONS WITH READINGS OVER 4 PICOCURIES PER LITER. SEVENTEEN OF THE 21 READINGS WERE IN ROOMS THAT WERE OCCUPIED BY STUDENTS. WE HAVE FOUND THAT THE PROBLEM OF RADON IN SCHOOLS IS NOT AS EASILY UNDERSTOOD AS THE PROBLEM OF RADON IN HOMES. THERE ARE SEVERAL MORE FACTORS THAT MUST BE CONSIDERED WHEN LOOKING AT SCHOOL BUILDINGS IN THE STATE OF NEW JERSEY. WE ALSO FEEL THAT THIS PROBLEM CAN BE HANDLED DIRECTLY BY THE STATES, WITH FUNDING FROM THE FEDERAL GOVERNMENT.

IN CONCLUSION, I WOULD LIKE TO THANK YOU FOR INVITING ME HERE THIS MORNING TO SHARE WITH YOU NEW JERSEY'S RADON EXPERIENCE. WE COMMEND THE SPONSORS OF THESE BILLS AND THE MEMBERS OF THE TWO SUBCOMMITTEES FOR ADDRESSING THIS ISSUE AND WE STAND READY TO ASSIST IN ANY WAY WE CAN.

LEGISLATIVE INFORMATION

TESTIMONY

OF THE

NATIONAL EDUCATION ASSOCIATION

AND

NATIONAL PTA

ON

RADON HAZARDS IN THE SCHOOLS

BEFORE THE

ENVIRONMENTAL PROTECTION

AND

SUPERFUND AND ENVIRONMENTAL OVERSIGHT

SUBCOMMITTEES

OF THE

ENVIRONMENT AND PUBLIC WORKS COMMITTEE

U.S. SENATE

PRESENTED BY

KENNETH F. MELLEY

DIRECTOR

NEA GOVERNMENT RELATIONS

APRIL 2, 1987

MARY HATWOOD FUTRELL, President • KEITH GEIGER, Vice President • ROXANNE E. BRADSHAW, Secretary-Treasurer
DON CAMERON, Executive Director
(202) 822-7300

Mr. Chairman and Members of the Committee:

I am Kenneth F. Melley, Director of Government Relations for the 1.8 million-member National Education Association. NEA members include education employees in every job classification in public elementary, secondary, postsecondary, and vocational educational institutions. The National PTA also endorses this statement.

I come before you today to speak on an issue of grave importance to the lives and health of America's schoolchildren and school employees: hazardous levels of radon in our nation's school buildings. I urge this Committee to support legislation to inspect school facilities for radon and provide guidance for school districts to limit exposure to hazardous radon gas.

NEA is deeply concerned by the hazards of radon, a colorless, odorless gas formed by the decay of radium and uranium. Radon generates radioactive products that can be inhaled into the lungs and can eventually cause lung cancer. Outdoors, radon is widely dispersed, but indoors radon can increase to hazardous levels because air flows less freely. According to the Environmental Protection Agency, there is no safe level of radon exposure.

For many years, NEA has worked for the establishment and rigorous enforcement of stringent standards and safeguards against radiation and other health hazards in the public schools. In particular, NEA has played a key role in drawing attention to the threat of cancer-causing asbestos in the schools and to the need for assistance to eliminate this hazard in the schools. Congress -- in recognition of the need to address the threat of

asbestos in the schools -- has made significant efforts in recent years to provide resources and guidance to school districts to conduct appropriate asbestos abatement work. Late last year, NEA provided information to all our members on the dangers of radon.

There is no question of the hazards of radon. The Environmental Protection Agency estimates that radon is responsible for between 10,000 and 30,000 cases of cancer each year; only cigarettes cause more.

Although knowledge of the hazards of radon gas is not new, awareness of the extent of radon contamination was not widespread until this decade. Moreover, the dangers of radon are becoming more prevalent because of renewed commitment to energy efficient construction. Airtight buildings are more likely to trap high concentrations of radon, creating an ever greater hazard.

Radon breaks down into radioactive decay products called radon daughters or progeny. These decay products attach themselves to dust particles and, if inhaled, can also adhere to passageways in the lungs. In the lungs, radon progeny decay futher, emitting alpha particles which can damage cells. This damage can cause cancerous cells to form.

Children, because their metabolism is more rapid and they tend to breathe more often than adults and because they are in early stages of their physical development, are more at risk than adults to the hazards of radon. But adults working in school facilities with high concentrations of radon are also at risk.

3

Radon is a health hazard throughout the country, primarily in areas with large deposits of radon-bearing minerals: uranium, granite, phosphate, and shale. Factors such as soil permeability, how close the uranium is to the surface, and the type of construction of a building can affect the amount of radon that gets indoors. Radon can enter a building in many different ways: through the crawl space or cracks in the foundation, through water supplied by underground wells, through joints in the foundation, loose fitting pipes, or through permeable construction materials, such as bricks and concrete.

Because radon cannot be seen or smelled, specialized equipment is needed to detect its presence. Radon gas is measured in terms of picoCuries per liter (pCi/l) of air, and radon decay products are measured in terms of working levels (WLS). One WL is equal to approximately 200 pCi/l of radon.

According to EPA estimates, the number of persons expected to die of lung cancer as a result of radon exposure over their lifetime can be as high as between 440 and 770 per 1,000 for those exposed to 1.0 WL of radon; as high as 270 to 630 for those exposed to .5 WL of radon; and 120 to 380 for those exposed to .2 WL (4 pCi/l) of radon. But persons face some degree of risk even if they are exposed to radon levels below EPA's radon action guideline of .02 WL.

Various devices can be used to test radon levels. One monitor contains a piece of treated plastic. Radiation entering the monitor etches ``tracks'' on the plastic, and the number of tracks appearing on the plastic indicates the level of radon.

Another testing device is a charcoal canister monitor which absorbs samples of dust that can be tested for radon in a laboratory.

There are several different methods for reducing indoor radon, including sealing off entry routes, installing high efficiency filters, increasing a building's air exchange rate, improving soil ventilation, and installing an air-to-air heat exchanger.

While most attention in recent years has centered on the problem of radon in private homes, it stands to reason that school buildings, built in the same areas and using similar construction techniques as private homes, are likely to have the similar health hazards. Students who spend from 6 to 9 hours a day in school buildings containing high levels of radon gas are exposed to a serious, silent, and deadly threat.

The risk of high concentrations of radon is greatest in areas of the country where high radon levels have been found in homes. In particular, one-floor schools, and schools with basement facilities that are frequently used by students, should be tested. School buildings that have not been renovated in many years -- which may have cracks in the foundation or other potential entry points for radon gas -- and school buildings that have been renovated to maximize energy efficiency should both be tested for radon gas.

To date, there have been few systematic inspections of public school facilities to test the presence of radon. One exception is Pennsylvania, where a survey of 140 schools in a high-risk

area, including the Reading Prong, uncovered 39 buildings with elevated radon levels.

Given the results of radon testing in private homes, there is clearly a need for inspections in the schools. And yet, the EPA has done nothing whatsoever to provide direction or assistance for radon inspection in the schools.

NEA strongly supports the Radon Detection in School Buildings Act, S. 743, authored by Sen. John Chafee and others. In addition, we support the State Radon Program Development Act, S. 744, authored by Sen. George Mitchell.

The Radon Detection in School Buildings Act would auhorize EPA to conduct a statistical survey for the purpose of determining the extent of radon contamination in the nation's school buildings. In addition, it would authorize funds to conduct tests in a large sample of the nation's schools and to test and perfect methods for ridding schools of radon when it is discovered. Providing recommendations to school districts for addressing the health threat of high concentrations of radon is a critical component of this legislation.

In addition, we believe there should be some provision made in the legislation to provide information about the results of these tests to parents, school employees, and the public in affected communities.

The State Radon Program Development Act would direct EPA to expand technical assistance to states on radon issue and provide financial resources to help states initiate radon related programs.

Exposure to radioactive radon gas is clearly a national problem requiring national solutions. These measures help gather and disseminate the type of information needed to make sound decisions as to what those solutions should be. Many states recognize that they have a radon problem but lack the resources to develop programs. Other states are concerned that they may have a radon problem, but do not have the resources for inspection and radon reduction projects.

In addressing the problems of radon, we must learn from experience in dealing with the hazards of asbestos. Stringent standards for protecting building occupants must be established at the outset. Testing radon gas levels must be performed by certified contractors according to prescribed procedures. Once the extent of radon contamination is determined, Congress must be prepared to move quickly to mandate that school districts take appropriate actions to reduce the threat of radon exposure. It is not enough to simply be aware of the danger; we must take immediate steps to diminish the danger. Finally, Congress must provide resources for those states and localities that are unable to afford radon testing and reduction.

Mr. Chairman, the National Education Association is committed to the principle that our children are our future. It is essential that our children are educated to meet the challenges of the future. But it is imperative that our generation protect the health of our children so that they may live to meet those challenges.

Thank you.

STATEMENT OF

DR. WILLIAM J. LEARY, JR.

SUPERINTENDENT OF SCHOOLS

EAST PENN SCHOOL DISTRICT

EMMAUS, PENNSYLVANIA

ON BEHALF OF

THE AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS

ON

S. 743, THE RADON DETECTION IN SCHOOL BUILDINGS ACT

BEFORE THE

ENVIRONMENTAL POLLUTION SUBCOMMITTEE

U. S. SENATE

APRIL 2, 1987

Mr. Chairman and members of the Subcommittee, my name is Bill Leary. I am the Superintendent of Schools in the East Penn School District in Emmaus, Pennsylvania. I am pleased to come here today to testify on behalf of the American Association of School Administrators (AASA), an organization representing over 17,000 local school executives on S. 741, the Radon Detection in School Buildings Act.

I would like to commend Senator Chafee for his leadership in developing a legislative proposal which seeks to identify whether or not there is a significant radon problem in schools across America. I would additionally like to commend both Senators Heinz and Specter from my state of Pennsylvania for their co-sponsorship of this legislation.

It is known that radon is an odorless, colorless, tasteless radioactive gas that occurs naturally when underground uranium deposits break down. While the gas is harmless in the natural environment, it becomes a dangerous health threat in high concentrations in enclosed areas. It can seep into buildings through cracks, pipe seals, and other avenues. It attaches itself to dust and can be inhaled by building occupants. EPA has determined that it is a leading cause of lung cancer and that children may be especially vulnerable.

The Pennsylvania Department of Health has estimated that the risk of dying from lung cancer is 5% for each .1 WL (working level) of lifetime exposure to radon gas in the air one breathes. This approximates the risk of lung cancer associated with smoking one pack of cigarettes per day throughout a lifetime. In a radon survey of a sample of 2,578 homes in our area of Pennsylvania reported in August 1985, 293 of them (11.3%) had working levels of radon above 20 picoCuries/liter or .1 WL. 44% of them (1,114) were found to have working levels of radon higher than the Department of Environmental Resource's standard of .02 WL, or 4 picoCuries/liter. A later survey of 19,137 homes tested by DER in the Reading Prong showed that 59% of them had radon levels above the .02 WL action guideline. All of this concern in Pennsylvania has elicited the testing of homes and public buildings in 35 of Pennsylvania's 67 counties; 32 of these are in the eastern part of the state.

My school district is located just outside Allentown, Pennsylvania, in what is known as the "Reading Prong" area. The Prong runs from eastern Reading through portions of Berks, Bucks, Lehigh and Northampton Counties in Pennsylvania. It continues through New Jersey, New York, and into Connecticut. A General Accounting Office (GAO) report requested by the Pennsylvania congressional delegation has found radon to be a problem in homes but does not address radon in schools. Pennsylvania is the only state that has collected data specifically on radon in schools. While radon has been found to be a problem in energy efficient homes, there is very little actual data about radon in schools.

Pennsylvania's Radon Monitoring Program has tested every public school building (128 buildings in 18 school districts) in the Reading Prong and has also tested the few non-public (12) schools that have requested it. Of those school buildings tested, 83 were found to contain radon levels below the federal guideline for acceptability (4 pCi/l or .02WL.). Additionally, there were 43 buildings with radon levels equal to or exceeding 4 pCi/l or .02 WL. Twenty-four of those that exceeded the acceptable level received supplemental diagnostic testing. The cost of proposed remediation ranged from a high of $43,000 to a low of $2,000. The average cost was $19,000. These remediation costs were sustained by the local education agencies.

On October 8, 1985 superintendents from six school districts in Lehigh and Berks Counties were summoned to a meeting in Harrisburg, Pennsylvania to meet with officials from the Pennsylvania Department of Environmental Resources, the Pennsylvania Department of Health and the Pennsylvania Department of Education. We were informed that in testing in our districts, 12 schools containing a total of 120 rooms were found to have working levels (WL) above the .02WL found to be "acceptable." The range of working levels was said to be .021 to .46WL.

I had received a report from DER in September 1985 that summarized testing done the previous May in the 12 school buildings in the East Penn School District. Eleven of them had no readings above .02 WL. One, a small, six room elementary school of 165 students had readings ranging from .07WL to .217WL from tests taken in 10 locations throughout the building. Officials indicated that any readings above .1WL would require some sort of

mitigation action within a 3 week to 3 month period of time. We were promised seed money of $1,500.00 per district from DER to retain the services of a radon assessment and mitigation firm. This firm was to do an initial study of the problem and draw up a series of alternatives for solving the problem. We moved ahead deliberately and, by December, we received another proposal from the company, to cost $6,305 to prepare drawings, specifications, bidding documents, project supervision and final inspection. Shortly thereafter, we selected the second of three mitigation designs, estimated to involve over $14,000 in construction costs. The other two were estimated to cost $4,657 and $35,054.

After the bids were received, the actual construction costs turned out to be $28,371.00. It is important to note that at its completion, following the Easter Holiday, this unforeseen project cost the East Penn School District $34,676 in unbudgeted funds. After the initial $1,500 grant from DER, all of the costs came directly back to the local school district.

I would also make the point that, like so many other problems, this is not just a school problem. We take the brunt of the hysteria and panic because we perform a valued public service, and we house and educate the young. In Pennsylvania, officials have estimated that 40% of the children in some schools are going home to a house which has higher levels of radon than any of those experienced in schools. Note also that this is not only a Pennsylvania or Reading Prong problem. A General Accounting Office study indicates that in Florida 200 of 1,000 homes tested in Polk County had readings above the "acceptable." .02 WL of the Environmental Protection Agency. In New Jersey, state testing of 71 homes in Clinton, New Jersey showed all 71 to have levels above .02 WL and 36 of them, or 51% had levels above 1.0 WL. Testing of homes in New York and Chicago have also shown unacceptable levels of radon in homes and public buildings.

AASA believes that there is a need for further study of the radon in schools issue. The fact that there is very little actual research data specifically on radon in schools is a cause for concern. School administrators across the nation want to assure that the school facilities which house America's school children are safe and do not pose health threats.

However, AASA encourages the members of this Subcommittee to consider several concerns about S. 743, the Radon Detection in School Buildings Act:

A. AASA feels that the basic premise of the legislation as stated in the purpose is somewhat biased toward the assumption that there is indeed a problem with radon in the nation's schools. AASA believes that the verdict is not yet in and that further study is needed. The legislation authorizes EPA "to conduct a study for the purpose of determining the extent to which radon in the Nation's public schools poses a threat to children, etc." AASA holds that the research does not support a basic assumption that there is a nervasive radon in schools problem. Based on conversations with environmental experts, AASA believes that the high rate of indoor and outside air exchange in school buildings makes the probability of radon contamination less prevalent in schools than in tightly-sealed, energy-efficient homes, where a great deal of research information is, in fact, available.

B. The "Findings" section indicates that: 1) radon contamination poses a significant threat to public health by causing 5,000 to 20,000 lung cancer deaths per year; 2) children "may be more sensitive" and "could be more at risk than adults from exposure to radon"; and 3) "30 percent of about 40,000 indoor radon measurements were above the level" recommended by EPA as an acceptable guideline" thus indicating that radon contamination is a national problem."

AASA is concerned that these "findings" may be somewhat misleading. First, it is our understanding that the 5,000 to 20,000 death figure is based on data collected in studying the exposure levels of underground miners to radon. While the exposure levels may be comparable to the levels found in some homes, AASA is fearful that the broad brush application of this figure to radon in schools may be premature at this time.

Secondly, while AASA accepts that children may be more vulnerable than adults to radon exposure, again we caution against assumptions about radon in schools that are not grounded in actual research findings.

Finally, the GAO report's death figures focus on radon found in homes and not in schools. AASA simply cautions that before assumptions are labeled as findings research should be complete and assumptions verified.

C. In Section 5(a) of the legislation, the Administrator is authorized to include in the study schools which use a "nonpublic water source." While radon contamination of the water supply might be explored as a part of the study, it should be remembered that radon escapes quickly from water whenever it is moved and that the cost of testing water for radon is twice as high ($25.00-$30.00) as the cost for testing the air ($12.00-$15.00). Additionally, we qeustion the availability of the expertise to do this kind of testing in the rural areas where this type of water source is likely to be found. EPA should be prepared to provide immediate technical assistance to school districts with nonpublic water sources. If assistance is not available, Congress should provide for the assistance with a separate appropriation.

D. AASA stongly supports the notion that schools where radon contamination is likely should be identified. However, Sections 5(b)(1) and (2) cause special concern for school executives. According to Section 5(b)(1), the EPA will develop a list of the schools that are "determined to have a relatively high probability of exceeding the Environmental Protection Agency's recommended target for remedial action." Then, according to Section 5(2), the list will be based upon: "(A) geological data; (B) data on high radon levels in homes and other structures nearby any such school; and (C) physical characteristics of the school buildings." AASA asks the following questions:

a. Will the geological data come from the National Uranium Exploration Study or will there be some other source? It is our understanding that this study is the basis of a map that reveals areas suspected of high radon probability.

b. If high levels of radon have already been found in neighboring homes, will bese schools be tested or will they be automatically placed on the list? AASA would oppose placing schools on a list based on the testing of homes.

c. What are the physical characteristics of the buildings which would be assessed? Who would complete the assessment and who will bear the costs?

d. Who will receive this list? Will it be published? In the original asbestos identification rule, after the testing was complete, the PTA was notified regarding the presence of asbestos. This notification frequently caused massive community alarm; when, in fact, the asbestos was not friable or was not in a place where children were likely to be affected. AASA simply cautions that placing a school on a list of suspects without clear evidence of a problem may render the school incapable of proving to parents that, in fact, there is not problem. We should be prudent and sound an alarm where necessary, but we should avoid unnecessarily alarming parents where there is not problem.

E. Finally, AASA would hope that the 1 million dollars authorized for the study is appropriated and is enough to cover all costs incurred to determine if there is a nationally significant radon problem in schools. Additionally, AASA would hope that the $500,000 for diagnostic and remedial efforts would be sufficient to allow EPA to develop technology and expertise to assist

local education agencies. Now and down the road, the costs of implementing federal recommendation or mandates must be supported by federal funds.

School budgets are already strained, and radon is not the only potential environmental issue with which schools must grapple. As we meet here today, individuals representing over 25 different interest groups are negotiating to develop rules to implement the new Asbestos Hazard Emergency Response Act of 1986.

This new legislation requires schools to reinspect for asbestos-containing materials (ACM), abate friable asbestos, and develop management plans to monitor asbestos which remains in the schools. All of these requirements are being implemented with no new federal assistance to implement these very costly requirements.

Please do not misinterpret the point that I am making here. It is not that school administrators want to shirk their responsibilities to provide a safe environment, but they also must have financial resources to actually educate the children. We all have budget constraints. All educators recognize that the health and safety of children are our concern as well as education. We simply ask that federal resources follow federal mandates.

Thank you for your time and consideration. I would be happy to answer any questions that you might have.

STATE OF FLORIDA
DEPARTMENT OF HEALTH AND REHABILITATIVE SERVICES

Statement of

Lyle E. Jarrett
Director, Office of Radiation Control
Florida Department of Health and Rehabilitative Services

to the
Senate Subcommittee on Environmental Protection
and the
Senate Subcommittee on Superfund & Environmental Oversight

on
The State Radon Program Development Act of 1987 (S.744)
and
The Radon Detection in School Buildings Act (S.743)

April 2, 1987
Washington, D.C.

Lyle E. Jarrett
Office of Radiation Control
Florida Department of Health and Rehabilitative Services
April 2, 1987

Since the early part of this century there has been an awareness of the existence of naturally-occurring radioactive materials in Florida when it was discovered that central Florida phosphate ore contained higher levels of uranium than did most other soils and rocks. In the mid-1970's, interest in this subject increased, due in part to a finding that some homes built in uranium mining areas of the Rocky Mountains had higher than desirable indoor radiation levels. At that time, both the U.S. Environmental Protection Agency and the Florida Department of Health and Rehabilitative Services performed surveys of indoor radiation in homes built in the central Florida phosphate region. The studies showed that about 20 percent of the homes surveyed had radiation levels above the recommended U.S. Environmental Protection Agency recommended guidelines. These survey results were completed and published in 1978. In 1979, the U.S. Environmental Protection Agency recommended that Florida take action to remediate homes having levels above the U.S. Environmental Protection Agency recommended guidelines, and that new homes built in the region incorporate construction techniques to resist the entry of radon gas, the principal decay product of uranium leading to an increased incidence of lung cancer.

Florida established a phosphate-related-radiation task force in 1980 to evaluate the situation and to recommend solutions. The task force included representatives from federal, state and local government agencies, research institutions, the phosphate industry and environmental organizations. The task force identified and evaluated available technology, identified needs for additional research and recommended various actions. Among the recommendations was the need to obtain authorizing legislation for establishment of state environmental radiation regulations.

In 1984, Florida's legislature authorized the Florida Department of Health and Rehabilitative Services to establish and enforce by rule environmental radiation standards.

In 1986, Florida became the first state to pass a statewide rule regulating exposure of its citizens to naturally occurring radioactive materials in the environment. The rule establishes standards for exposure of the public to both gamma radiation and to radon decay products in new homes, schools and commercial buildings. Additionally, the rule requires the use of prescribed radon-resistant building techniques in regions of the State where elevated radon levels are likely.

Regions in the state where the rule is to be applied are currently being identified through a million dollar statewide radon study being conducted by the Florida Institute of Phosphate Research. The study is expected to be completed by September, 1987. Also a radon peer review committee consisting of representatives from the phosphate industry, realtors, builders, environmentalists, and the Florida Department of Health and Rehabilitative Services, has been established to evaluate the statewide radon study.

Long-term radon policy direction for Florida is being developed by a Department of Health and Rehabilitative Services internal work group. The work group has identified the following problem areas needing resolution:

1) Improved building construction codes that have an acceptable degree of assurance for resisting radon entry into buildings.

2) Predictors of potential radon levels in buildings based on soil measurements.

3) Determination of the extent of health risks at low levels of radon in buildings.

4) Reliability of current short-term and long-term radon measurement devices and procedures.

5) Determination of legal liability for actual or alleged health damage from radon.

6) Determination of the extent and mechanism for notification of the potential health risks from radon.

7) Certification of radon measurement and mitigation companies that have demonstrated acceptable levels of technical proficiency.

8) Establishment of appropriate radon informational and educational programs that do not overstate or understate the health risks.

Lyle E. Jarrett
Office of Radon Control
Florida Department of Health and Rehabilitative Services

The U.S. Environmental Protection Agency has been supportive of the State's radon programs within the limits of their resources. The State Radon Program Development Act of 1987 and the Radon Detection in School Buildings Act will add to the U.S. Environmental Protection Agency's ability to improve assistance to states in dealing with radon issues. The legislation clearly indicates that the radon problem is national in scope and requires cooperative efforts at all levels to reach satisfactory resolution. The activities provided for in these bills will assist in the overall national effort to identify the extent of the radon problem and develop better techniques for dealing with elevated radon levels in buildings. It is critical that the U.S. Environmental Protection Agency continue to provide strong national leadership to maximize the effective use of federal, state and local funds, and assure that radon projects funded through these two bills are not redundant.

# # #

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES
Post Office Box 2063
Harrisburg, Pennsylvania 17120

The Secretary

717-787-2814

APR 17 1987

Honorable George J. Mitchell
Chairman, Subcommittee on Environmental
Protection
Senate Committee on Environment and Public Works
SD-410 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Mitchell:

I am enclosing for the record of April 2, testimony which presents our views on radon contamination legislation pending before your subcommittee. We appreciate the interest of the Congress in the radon problem, which was originally discovered in Pennsylvania. Many of our efforts to assess the extent of the problem and assist our citizens with remediation have been carried out in cooperation with the federal government. An expanded state/federal partnership is certainly appropriate at this time.

We regret we had to decline the invitation of the subcommittee to deliver our testimony in person and hope we will be able to share our thoughts with you at any future hearings you may schedule.

Sincerely,

Arthur A. Davis
Secretary

Enclosure

TESTIMONY FOR THE RECORD

Submitted by

ARTHUR A. DAVIS
SECRETARY
PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL RESOURCES
P.O. BOX 2063, HARRISBURG, PA 17120

HEARING ON S. 743 and 744
SUBCOMMITTEE ON SUPERFUND AND ENVIRONMENTAL OVERSIGHT
AND SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
APRIL 2, 1987

We appreciate the opportunity to share our views on the future direction of state and federal radon programs.

We applaud the subcommittees' interest in the radon issue. Pennsylvania is very concerned that federal resources expended on the radon problem be adequate and appropriately spent. We support legislation introduced by members of the Environment and Public Works Committee. A well-designed national study of schools as proposed in S. 743 could indeed shed more light on the relative health risks to children posed by radon in school buildings. We support the emphasis that S. 744 places on state programs. Finally, we know this committee is aware of the President's request to cut radon funds for the Environmental Protection Agency, and hope you will continue your efforts to make sure this does not happen. Funds for a new state grant program should be in addition to activities undertaken by EPA.

Pennsylvania's Radon Programs

Pennsylvania had to take the lead in investigating the problem of radon in structures following the December 1984 discovery of an extremely high level of radon in a home in Berks County. The level in that first home was approximately 2700 picocuries/liter of radon or 13.5 Working Levels of radon daughters, equivalent to 675 times the present EPA guidance level of 0.02 WL or 4 picocuries/liter.

At that time, there was no specific guidance or standards for exposure to naturally occurring radon in private dwellings. There are still no standards.

For the record, we are attaching to the written testimony a copy of a

paper authored by Mr. Thomas M. Gerusky, Director of our Bureau of Radiation Protection, entitled THE PENNSYLVANIA RADON STORY, which appeared in the January/February 1987 issue of the JOURNAL OF ENVIRONMENTAL HEALTH (V.49(4) 197-200). That paper summarizes our activities in radon monitoring and mitigation through November, 1986.

Radon activities in Pennsylvania are moving at a rapid pace, and a short update is in order. We have now screened over 19,200 homes and have found 107 homes with screening levels in excess of 200 picocuries/liter or 1 WL. Approximately 60% of the homes screened have levels in excess of the 4 picocurie/liter or 0.02 WL guideline number. All of these homes are located within the Reading Prong, a geologic formation which extends in Pennsylvania from Berks County, into Lehigh, Northampton, and Bucks County, and then into New Jersey and New York. All of these tests were performed free of charge. Even with the free tests and many solicitations within the test area, we estimate that only 30% of the residents have taken advantage of this service.

A low-interest loan program was established to assist homeowners with remedial costs. Other programs, including a million dollar research and demonstration program on remedial methodology are continuing. Well over 100 homes should be remediated in that program.

The private sector has become involved in radon testing and remediation in a big way in Pennsylvania. Results of the private testing are made available to the Department on a confidential basis. We have reports that over 35,000 private tests have been completed in the Commonwealth. Information from the private sector plus an evaluation of potential elevated radon areas from geological features, and data from follow-up surveys performed by the Department staff has shown that problem is not confined to the Reading Prong. On March 19, 1987, the Department issued a press release advising residents in 35 of the 67 counties in Pennsylvania that radon screening should be carried out in all homes in these counties. It is very possible that as more information is received, other counties will be included in the advisory.

We have added 21 positions to the Bureau of Radiation Protection staff to handle the radon program alone, established an office in the Reading Prong area, opened a toll free telephone number (1-800-23-RADON) to answer public inquiries from across the state, established a public information and education program, and are continuing our efforts to assist the residents of Pennsylvania in coping with this new and serious environmental health problem. Our continuing budget for routine radon activities is approximately $1.5 million per year.

We are presently concentrating our efforts in two areas. Using either geologic information or actual data from our program and the private sector monitoring program, we are performing additional screening studies in small areas where clusters of high homes indicate unusual problems. We are also performing free follow-up measurements at the request of the homeowner when private sector monitoring indicates levels in excess of 0.1 WL or 20 picoCuries/liter. We are recommending that homeowners with levels between the guideline and 20 picocuries/liter place a year-long alpha-track detector in their normal living area, since the guideline is based upon annual average exposure over many years.

Legislation is now being considered in the Pennsylvania Senate and House of Representatives which would require that our agency establish standards and certify private testing organizations and remedial contractors to assure the residents that they are not being victimized by unqualified or unscrupulous firms or individuals. We are supporting that legislation.

RADON IN SCHOOLS

Pennsylvania's Activities

We have provided free radon testing for 182 different school buildings in both the public and private sector. Seventy buildings had at least one room with levels in excess of the 4 picocurie/liter guideline. Only 2 rooms exceeded 20 picocuries/liter. The maximum concentration was 50 picocuries/liter.

Because school buildings are large and are constructed differently than most private residences, diagnosis of the problem in detail and recommended remedial actions were provided to the school districts through a contract provided by the Department with a private firm with expertise in remediation. At an original cost of $3300 per school building, the contractor provided detailed radon survey information, recommended remediation, and estimated cost. Our most recent contractor is providing the same services at a cost of $1400 per building. Remedial cost estimates varied from $2,000 to $33,000, with an average cost in the range of $20,000. Only one school has had the remediation performed to date. The cost was $28,000.

ASSISTANCE TO STATES

Views on S. 743

We support a national assessment of the radon problem in school buildings such as that proposed in S. 743. Other school districts in areas outside the initial free survey area have been contacting us to

request similar screening surveys. There are approximately 3300 public school buildings in Pennsylvania. We have yet to decide how to handle these requests, but we are very conscious of the concern of the parents who are sending their children to these schools and are also aware that school boards are concerned about their potential liability if radon levels are found to be in excess of the EPA guideline.

School buildings are indeed not small private residences and we must deal with them in a different manner. Under normal circumstances, one would determine exposure by estimating the amount of time the children do spend in school, compared to the time spent away from school since the guidelines are based upon much longer exposure times. That was ruled out quickly in Pennsylvania because of the concern that the children could be returning home to a radon level even higher than the one they were exposed to at school.

There are also some serious questions concerning radon survey methodology. A long term monitor may overestimate the concentrations because some schools reduce ventilation rates during the evening and when closed for weekends or vacations. The normal method of using a charcoal monitor or a track-etch device may have to be changed to a constant air monitor, which records the levels at distinct intervals. This is indeed an area where more research needs to be done and a methodology devised which will more accurately estimate the real exposure of the students and staff.

Views on S. 744

Pennsylvania was thrust into the radon program with the discovery of extremely high levels in the first home. We have not yet found another home with levels equalling the Watras house. We have heard rumors that a home with higher levels has been found in another state. In any case, Pennsylvania's program naturally evolved with the discovery of more homes with high levels, and as we get deeper into the issue, the more we discover that we are still learning.

Pennsylvania has received much assistance from EPA's Office of Radiation Programs and we commend them for the quality program which has been carried out with very little funding. Pennsylvania has probably spent as much money over the past 2 years on radon as EPA has.

There is a real need for seed money for other states to become involved in the radon testing and remediation programs and we wish to compliment the Senators who wrote and sponsored these two bills.

There is indeed a great deal of work to be done before we have the problem under control. The states are the logical place to implement a national program, but they will need the support of an expanded federal program. Specifically, activities should include:

- Research on additional testing methodology;
- Pre-construction design for new homes;
- A survey method to determine radon prone areas;
- A testing technique for individual building lots;
- A coordinated and well-funded epidemiological study to determine if the guideline values are correct;
- The continuation of the present high quality proficiency testing program;
- Continuation of the studies of remedial techniques;
- Continuation and expansion of training programs;
- Continuation and expansion of the public information programs;
- Institution of a national data base and technology transfer program;
- A national study to determine the average level of radon exposure in the country, but large enough to be statistically capable of comparing average levels from state to state.

Programs and for radon research in EPA is not adequate for so serious an environmental health problem. Without adequate funding at the federal level, the states can do little but re-invent the radon wheel another 49 times.

The radon problem is a national one, and is not necessarily isolated to those states like Pennsylvania that have gone out looking for it. Other state environmental health program administrators would welcome any financial assistance they may be able to receive to begin the process of determining if and where the radon problem is in their states. We, too, welcome additional financial and programmatic support as we see our program growing to meet the needs of Pennsylvanians.

CONCLUSION

We support the passage of these bills and urge that your Committee take a hard look at the EPA budget to assure that there is adequate financial support for the Office of Radiation Programs and for radon research and development in the EPA research budget. There is no justification for reducing staff in either of these areas when such an important environmental health problem has just surfaced.

II

100TH CONGRESS
1ST SESSION

S. 743

To authorize the Environmental Protection Agency to conduct a study for the purpose of determining the extent to which radon in the Nation's schools poses a threat to children and employees within such schools, and for other purposes.

IN THE SENATE OF THE UNITED STATES

MARCH 12, 1987

Mr. CHAFEE (for himself, Mr. MITCHELL, Mr. STAFFORD, Mr. HEINZ, Mr. REID, Ms. MIKULSKI, Mr. LAUTENBERG, Mr. SPECTER, and Mr. DURENBERGER) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To authorize the Environmental Protection Agency to conduct a study for the purpose of determining the extent to which radon in the Nation's schools poses a threat to children and employees within such schools, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "Radon Detection in School Buildings Act".

FINDINGS

SEC. 2. The Congress finds that—

(1) indoor radon contamination poses a significant threat to public health and, according to the Environmental Protection Agency, radon causes between 5,000 and 20,000 lung cancer deaths per year and may be second only to smoking in causing lung cancer;

(2) according to the Environmental Protection Agency, scientific studies of other types of radiation exposure indicate that children may be more sensitive and, consequently could be more at risk than adults from exposure to radon; and

(3) a General Accounting Office report notes that 30 percent of about 40,000 indoor radon measurements were above the level at which the Environmental Protection Agency recommends that action be taken so as to reduce such level, thus indicating that indoor radon contamination is a national problem.

PURPOSE

SEC. 3. The purpose of this Act is to authorize the Administrator to conduct a study to determine the extent of radon contamination in the Nation's school buildings.

DEFINITIONS

SEC. 4. For purposes of this Act, the term—

(1) "Administrator" means the Administrator of the Environmental Protection Agency;

(2) "local educational agency" means—

(A) any local educational agency as defined in section 198 of the Elementary and Secondary Education Act of 1965 (20 U.S.C. 3381);

(B) the owner of any non-profit elementary or secondary school building; and

(C) the governing authority of any school operated pursuant to section 6 of the Act of September 30, 1950 (Public Law 874, 81st Congress) relating to impact aid for children of members of the Armed Forces;

(3) "non-profit elementary or secondary school" means any elementary or secondary school (as defined in section 198 of the Elementary and Secondary Education Act of 1965) owned and operated by one or more nonprofit corporations or associations no part of the net earnings of which inures, or may lawfully inure, to the benefit of any private shareholder or individual;

(4) "school building" means—

(A) structures suitable for use as classrooms, including school facilities such as laboratories, libraries, school eating facilities, or facilities used for the preparation of food;

(B) any gymnasium or other facility which is specially designed for athletic or recreational ac-

tivities for an academic course in physical education;

(C) other facilities used for the instruction of students or for the administration of educational or research programs; and

(D) maintenance, storage, or utility facilities essential to the operation of the facilities described in subparagraphs (A), (B), and (C); and

(5) "State" means a State, the District of Columbia, the Commonwealth of Puerto Rico, Guam, American Samoa, the Northern Marianas, the Trust Territory of the Pacific Islands, and the Virgin Islands.

STUDY OF RADON IN SCHOOLS

SEC. 5. (a) The Administrator shall conduct a study for the purpose of determining the extent of radon contamination in the Nation's school buildings, including in the case of a school using a nonpublic water source (such as a well or other groundwater), radon contamination of the water.

(b)(1) In carrying out such study, the Administrator shall conduct a statistical survey of radon levels in schools, including contributions from soil, water, or other significant sources where appropriate, and compile a list of the school districts within the United States which the Administrator determines have a relatively high probability of exceeding the Environmental Protection Agency's recommended target level for remedial action.

(2) In compiling such list, the Administrator shall make such determinations on the basis of, among other things, the following:

(A) geological data;

(B) data on high radon levels in homes and other structures nearby any such school; and

(C) physical characteristics of the school buildings.

(3) In conducting such study the Administrator shall design a statistical survey which when completed allows Congress to characterize the extent of radon contamination in each State. However, the survey model should be weighted to direct more schools to be tested in those districts identified in paragraph (1) of this subsection.

(c)(1) For the purpose of assisting the Administrator in conducting the study required by this Act, the Administrator is authorized to make available to the appropriate agency of each State, as designated by the Governor of such State, technical advice, publications, and assistance necessary to assist such agencies in testing for radon within school buildings.

(2) In addition to the assistance authorized by paragraph (1) of this subsection, the Administrator is authorized to make available to appropriate agencies of each State, as designated by the Governor of such State, cannisters or other devices suitable for use by such agencies in conducting tests for radon

within the schools under the jurisdiction of any such State agency. The Administrator is authorized to make available to such agencies the use of laboratories of the Environmental Protection Agency, or to recommend laboratories, to evaluate any such cannisters or devices for the presence of radon levels.

(d) The Administrator is authorized to select, from school districts identified in subsection (b), school buildings for purposes of enabling the Administrator to undertake diagnostic and remedial efforts to reduce the levels of radon in such school buildings. Such diagnostic and remedial efforts shall be carried out with a view to developing technology and expertise for the purpose of making such technology and expertise available to any local educational agency and the several States.

(e) On or before the expiration of the 12-month period following the date of the enactment of this Act, the Administrator shall submit to the Congress a status report with respect to action taken by the Administrator in conducting the study required by this Act, including the results of his or her diagnostic and remedial work. On or before the expiration of the 24-month period following such date of enactment, the Administrator shall submit a final report setting forth the results of the study conducted pursuant to this Act, including

the results of the Administrator's diagnostic and remedial work, and the recommendations of the Administrator.

SCHOOLS NOT AT HIGH RISK

SEC. 6. With respect to school districts not included on the list compiled by the Administrator pursuant to subsection (b) of section 5, the Administrator is authorized to make available to such districts information and other data detailing the risks associated with high radon levels, and advice and other information concerning ways to test for radon within such schools and water supplies.

REGULATIONS

SEC. 7. The Administrator is authorized to issue such regulations as may be necessary to carry out the provisions of this Act.

AUTHORIZATION

SEC. 8. (a) For the purpose of carrying out the provisions of subsection (d) of section 5, there is authorized to be appropriated such sum, not to exceed $500,000, as may be necessary.

(b) For the purpose of carrying out the provisions of this Act other than subsection (d) of section 5, there is authorized to be appropriated such sum, not to exceed $1,000,000, as may be necessary.

II

100TH CONGRESS
1ST SESSION

S. 744

To assist States in responding to the threat to human health posed by exposure to radon.

IN THE SENATE OF THE UNITED STATES

MARCH 12, 1987

Mr. MITCHELL (for himself, Mr. CHAFEE, Mr. STAFFORD, Mr. LAUTENBERG, Mr. MOYNIHAN, Mr. DURENBERGER, Ms. MIKULSKI, Mr. REID, Mr. DODD, Mr. KERRY, Mr. HEINZ, Mr. GORE, Mr. DASCHLE, Mr. SPECTER, Mr. GRAHAM, Mr. WIRTH, and Mr. BRADLEY) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To assist States in responding to the threat to human health posed by exposure to radon.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION 1. This Act may be cited as the "State Radon Program Development Act of 1987".

FINDINGS

SEC. 2. The Congress finds that—

(1) exposure to radon poses a serious threat to public health in certain areas of the country and is esti-

mated to cause between 5,000 and 20,000 lung cancer deaths each year;

(2) Federal response to the health threat posed by radon is essential and should continue at existing or expanded levels;

(3) State governments should play a role in responding to the health threat posed by radon; and

(4) Federal assistance to States will make possible a coordinated Federal-State effort to respond to the health threats posed by radon.

DEFINITIONS

SEC. 3. For the purposes of this Act, the term—

(1) "Administrator" means the Administrator of the Environmental Protection Agency;

(2) "radon" means the radioactive gaseous element, and its short lived decay products produced by the disintegration of the element radium; and

(3) "State" means the 50 States, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, the Northern Mariana Islands, American Samoa, and the Trust Territories.

TECHNICAL ASSISTANCE TO STATES

SEC. 4. (a) The Administrator, or another Federal department or agency when designated by the Administrator, shall develop and implement activities designed to assist

State radon programs. These activities may include, but are not limited to—

(1) establishment of a clearinghouse of radon related information including mitigation studies, public information materials, surveys of radon levels, and relevant information;

(2) design and implementation of training seminars for State and local officials dealing with radon and addressing topics such as monitoring, analysis, mitigation, health effects, public information and program design;

(3) certification of radon measurement devices and methods;

(4) publication of public information materials concerning radon health risks and methods of radon mitigation;

(5) demonstration of radon mitigation methods in various types of structures and in various geographic settings and publication of findings;

(6) cataloging qualified private firms offering radon related architecture, design, engineering, and mitigation services; and

(7) establishment of a national data base, with data organized by State, concerning the location and amounts of radon.

(b) Upon request of a State, the Administrator, or another Federal department or agency when designated by the Administrator, may provide technical assistance to such State in development or implementation of programs addressing radon. Such assistance may include, but shall not be limited to—

(1) design and implementation of surveys of the location and occurrence of radon within a State;

(2) design and implementation of public information and education programs;

(3) design and implementation of State programs to control radon in existing or new structures; and

(4) assessment of mitigation alternatives in unusual or unconventional structures.

(c) The Administrator, or another Federal department or agency when designated by the Administrator, shall provide appropriate information concerning technology and methods of radon assessment and mitigation to professional organizations representing private firms involved in building design, engineering, and construction.

(d) Within 180 days after the date of the enactment of this Act and annually thereafter, the Administrator shall submit to Congress a plan identifying assistance to be provided under this section and outlining personnel and financial resources necessary to implement this section. Prior to sub-

mission to Congress, this plan shall be reviewed by the advisory groups provided for in section 403(c) of the Superfund Amendments and Reauthorization Act of 1986.

GRANT ASSISTANCE TO STATES

SEC. 5 (a) For each fiscal year upon application of the Governor of a State, the Administrator may make a grant, subject to such terms and conditions as the Administrator considers appropriate, under this section to such State for the purpose of assisting the State in the development and implementation of programs for the assessment and mitigation of radon.

(b) An application for a grant under this section in any fiscal year shall contain such information as the Administrator shall require, including—

(1) an assessment of the seriousness and extent of radon exposure in the State;

(2) an identification of the State agency which has the primary responsibility for radon programs and which will receive the grant, a description of the roles and responsibilities of the lead State agency and any other State agencies involved in radon programs, and description of the roles and responsibilities of any municipal, district, or areawide entity involved in radon programs;

(3) a description of the activities and programs related to radon which the State proposes in such year; and

(4) a budget specifying Federal and State funding of each element of activity of the grant application.

(c) Activities eligible for such Federal grant assistance are—

(1) survey of radon levels, including special surveys of geographic areas or classes of buildings (such as, among others, public buildings, school buildings, high risk residential construction types);

(2) development of public information and educational materials concerning radon assessment, mitigation, and control programs;

(3) implementation of programs to control radon in existing and new structures;

(4) purchase by the State of radon measurement equipment or devices, including assistance to persons which the State determines to be low-income;

(5) purchase and maintenance of analytical equipment connected to radon measurement and analysis, including costs of calibration of such equipment;

(6) payment of costs of Environmental Protection Agency approved training programs related to radon for permanent State employees;

(7) payment of general overhead costs and program administration costs, consistent with applicable regulations of the Environmental Protection Agency;

(8) development of a data storage and management system for information concerning radon occurrence, levels, and programs; and

(9) payment of costs of demonstration of radon mitigation methods and technologies, as approved by the Administrator.

(d) The Administrator shall support eligible activities proposed in State applications with the full amount of available funds. In the event that State applications for funds exceed the total funds available in a fiscal year, the Administrator shall give priority to activities or projects proposed by States based on the following criteria—

(1) the seriousness and extent of the radon contamination problem to be addressed;

(2) the potential for the activity or project to bring about reduction in radon levels;

(3) the potential for development of innovative radon assessment techniques, mitigation measures, or program management approaches which may be of use to other States; and

(4) the need to assist each State submitting an application in development and implementation of an appropriate radon program.

(e) The Federal share of the cost of radon program activities implemented with Federal assistance under this section in any fiscal year shall not exceed 75 percent of the costs incurred by the State in implementing such activities and shall be made on the condition that the non-Federal share is provided from non-Federal funds.

(f) Notwithstanding any other provision of this section, not more than 15 percent of the amount appropriated to carry out this section may be used to make grants to any one State, including any grants to local governments or areawide organizations in such State.

(g) Funds not obligated to States in the fiscal year for which funds are appropriated shall remain available for obligation during the next fiscal year.

(h) Funds granted to a State pursuant to this section in a fiscal year shall remain available for obligation by such State for the fiscal year for which appropriated.

(i) States may use funds from grants under this section for financial assistance to persons only to the extent such assistance is related to demonstration projects or the purchase and analysis of radon measurement devices.

(j) States may, at the Governor's discretion, use funds from grants under this section to assist local governments in implementation of activities eligible for assistance under sections 5(c) (2), (3), and (6).

(k) No grant may be made under this section in any fiscal year to a State which in the preceding fiscal year received a grant under this section unless the Administrator determines that such State satisfactorily implemented such grant funded activities in such preceding fiscal year.

(l) The Administrator may request such information, data, and reports of the State as he considers necessary to make the determination of continuing eligibility under this section.

(m) The costs of purchasing radon measurement devices under section 5(c)(4) shall not exceed 10 percent of the amount of the grant in such year. The costs of implementing demonstration programs under section 5(c)(9) shall not exceed 10 percent of the amount of the grant in such year. The costs of personnel and program administration under section 5(c)(7) shall not exceed 25 percent of the amount of such grant in such year.

AUTHORIZATION

SEC. 6. There are authorized to be appropriated to carry out this Act not to exceed $10,000,000 for each of the fiscal years 1988, 1989, and 1990.

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